CODICO® E-1000 Series

MPEG-2 Professional Encoders

USER MANUAL

SCOPUS DOCUMENTS (P/N 100474)
(REV 1.0 / MARCH 2004)

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DOCUMENT HISTORY

VERSION	DATE	DETAILS
Rev. 0.0	Feb. 2004	First release for the E-1000 Series of MPEG-2 Professional Encoders. This series includes the CODICO® E-90, E-900, E-900A, E-1000 and the CODICO® E-1200 Advanced MPEG-2 Encoder. Official release for E1000 / 4.03 software version
Rev. 1.0	March 2004	New format and head page

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INTRODUCTION

Scopus Network Technologies Ltd. takes great pride in delivery of its products, and makes every endeavor to ensure its clients full satisfactory.

On behalf of all the Scopus team, we would like to extend our congratulations on your investment in the CODICO® E-1000 Series of MPEG-2 Professional Encoders.

E-1000 SERIES OF MPEG-2 PROFESSIONAL ENCODERS

CODICO® PRODUCT LINE

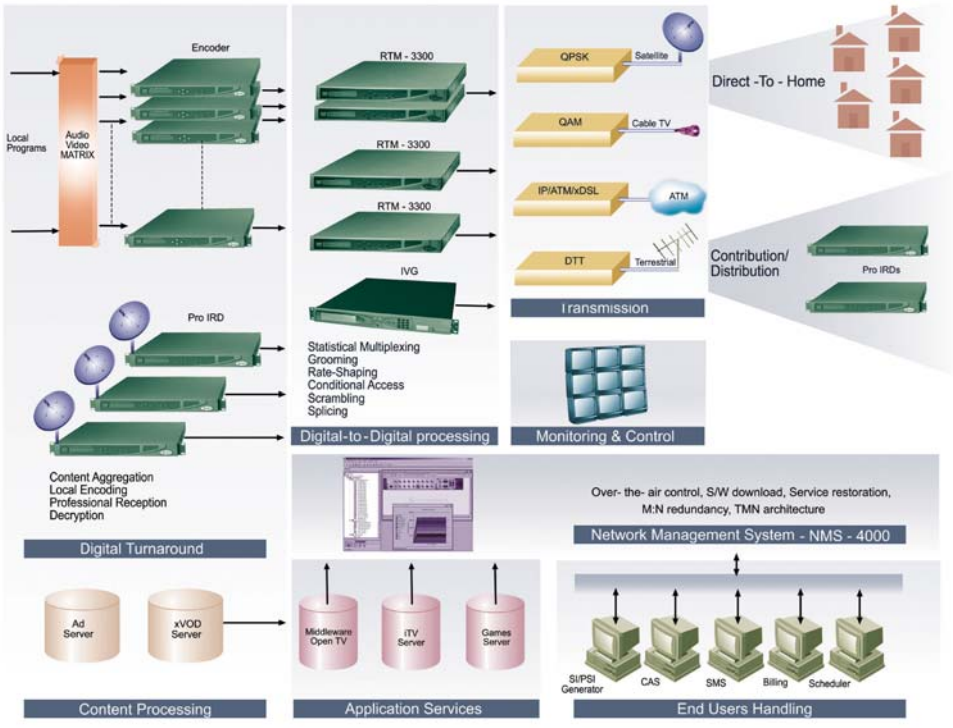
The E-1000 Series of Professional MPEG-2 Encoders is an integral member of the advanced CODICO® product line.

The CODICO® product family offers comprehensive solutions for both transmission sites and reception stations. In addition, it is the most cost-effective solution for TV broadcasting applications.

The following table lists the CODICO® product family and the illustration shows the integration of the members of the product line in a DVB environment.

PRODUCT	DESCRIPTION
E-90	Entry Level MPEG-2 Encoders
E-900A	Audio Professional Encoders
E-900/E-1000	MPEG-2 Professional Encoders
E-1200	MPEG-2 Advanced Encoders
E-1800	HDTV Encoder
E-1510	DSNG Encoders and Up Converters
E-1710/E-1720	DSNG Encoders and Modulators/Exciters
MOD-6810 Line	DSNG Modulator

PRODUCT	DESCRIPTION
IRD-2450	HDTV Integrated Receiver Decoder
IRD-2600/IRD-2800	Advanced Professional Integrated Receiver Decoders
CID-3100	Common Interface Decryptor
RTM-3300	Compact DVB Re-Multiplexer and Stream Processor
RTM-3800 Series	DVB Multiplexers
IVG-7000 Series	Intelligent Video Gateways
RSW-7x00 Series	Redundancy Switches
NMS-4000 Family	Complete Network Management System
CAS-5000 Series	Conditional Access System
SM-30x0 Series	Statistical Multiplexing Systems
SI-3050 Series	PSI/SI Generator Applications



MANUAL SCOPE AND STRUCTURE

The User Manual for the CODICO® E-1000 Series of MPEG-2 Professional Encoders provides instructions for qualified technicians to facilitate optimum performance of the E-1000 Series in a Digital Video Broadcasting System. The manual is comprised of the following main sections:

SECTION 1: OVERVIEW
This section provides introduction and product description, including typical applications, describes the functional and physical structure of the unit and lists its main capabilities and specifications.

SECTION 2: INSTALLATION
This section provides data and procedures required to install and activate the unit.

SECTION 3: FRONT PANEL OPERATION
This section provides theoretical and detailed information regarding operating the control and monitoring functions provided from the E-1000 Front Panel.

SECTION 4: ADVANCED OPERATION
This section provides advanced information for operating high-level options, including software installation and updating, remote control via SNMP and configuration using VI tools.

SECTION 5: MAINTENANCE
This section provides instructions for performing operational tests on the encoder and for troubleshooting failures in the encoder operation.

NOTES

It is assumed throughout this document that personnel have general knowledge about the E-1000 Series of MPEG-2 Professional Encoders, their applications and capabilities.

General knowledge of the CODICO® System and its applications is also assumed. For detailed information, refer to the CODICO® MPEG-2 DVB Family Product Description documents.

TECHNICAL SUPPORT

In case of technical problems with the CODICO® system or one of its components, refer to the System Documentation. In most instances, this may save you time in resolving technical difficulties.

Should you not be able to resolve the problem, call your local distributor for technical support.

HOW TO RETURN FAULTY PARTS

Before returning an item:

1. Request an RMA (Return Merchandise Authorization) Tracking Number from your local Distributor.
2. Scopus Network Technologies Support will assign an RMA Tracking Number; this must accompany the item returned and will be referred to in all correspondence.
3. Send the item to Scopus Network Technologies with the RMA Number included in the accompanying documentation (shipping and customs forms).

CUSTOMER SUPPORT POINT OF CONTACT (POC)

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CE Certification

The CODICO® E-1000 Series of Professional Encoders (CODICO® E-90, CODICO® E-900, CODICO® E-900A, CODICO® E-1000, CODICO® E-1200) meet all the CE Class B requirements.

FCC Compliance Notice

Trade Name	**Scopus**
Product Name	Entry Level MPEG-2 Encoder
Product Model Number	CODICO® E-90
Product Name	MPEG-2 Encoder
Product Model Number	CODICO® E-900
Product Name	Audio Broadcast Encoder
Product Model Number	CODICO® E-900A
Product Name	Broadcast MPEG-2 Encoder
Product Model Number	CODICO® E-1000
Product Name	Advanced MPEG-2 Encoder
Product Model Number	CODICO® E-1200

These devices comply with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interferences that may cause undesired operation.

Responsible Party:

Responsible Party's Name	Carlo Basile
Address	100 Overlook Center Drive, 3rd Floor Princeton, NJ 08540. USA
Communication	Tel: (609)-987-8090 Fax: (609)-987-8095 E-Mail: info@scopususa.com

THE FCC WANTS YOU TO KNOW

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to Provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, If not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician.

FCC WARNING

MODIFICATIONS NOT EXPRESSLY APPROVED BY THE MANUFACTURER COULD VOID THE USER AUTHORITY TO OPERATE THE EQUIPMENT UNDER FCC RULES.

WARRANTY

SCOPUS Network Technologies Ltd. warrants that the Product and any part thereof, including, but not limited to spare parts, will, when properly installed, conform to SCOPUS Network Technologies Ltd. published specifications and that the Product and any parts thereof, including, but not limited to, spare parts, will be free from defects deriving from wrong workmanship and faulty materials under normal use and service, for a period of twelve (12) months following the date of manufacture thereof.

The supply of spare parts at reasonable cost shall be available for a period of three (3) years from the date of delivery.

This warranty does not cover ordinary wear and tear of the Product or other defects due to circumstances beyond SCOPUS Network Technologies Ltd. control such as unsuitable operating means, chemical, Electro-mechanical or electrical influences and damages which may be caused by interference by the CUSTOMER or any unauthorized third party.

Defective cards/assemblies will be sent to SCOPUS Network Technologies Ltd. for repair. The repaired cards/assemblies will be returned to the CUSTOMER within 30 days from their receipt by SCOPUS Network Technologies Ltd.

Cards/assemblies repaired during the 12 months warranty period will carry a warranty of 6 months from date of repair or until end of original warranty period, whichever is the later date.

SCOPUS Network Technologies Ltd. sole liability under this warranty shall be limited to the repair or replacement with equivalent units at SCOPUS Network Technologies Ltd. facilities, of any Product or parts thereof that do not conform to SCOPUS Network Technologies Ltd. published specifications or that are defective in material or workmanship, as specified above. The expense of installing repaired or replaced parts shall be borne by the CUSTOMER.

SCOPUS Network Technologies Ltd. sole obligation under this Warranty is be the supplier of the Product to the CUSTOMER and to provide such services as set out in this Warranty on the SCOPUS Network Technologies Ltd. terms and conditions provided for herein. In no event will SCOPUS Network Technologies Ltd. be liable to the CUSTOMER for any business expenses, loss of profits, incidental, indirect or consequential damages, however caused, unless such expenses, loss or damages shall have derived from an infringement of patents of copyrights.

THE WARRANTIES STATED HEREIN ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Beyond the warranty period, SCOPUS Network Technologies Ltd. shall repair or replace defective cards/assemblies according to its standard price list relevant at such time. Cards/assemblies thus repaired shall carry a warranty of 6 months.

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Section 1
OVERVIEW

1.1. GENERAL INFORMATION

The CODICO® E-1000 Series of MPEG-2 Professional Encoders is a family of advanced MPEG-2 DVB encoders of the Main/Professional Profile @ Main Level compression standard (4:2:0/4:2:2 compression).

The E-1000 Encoders are designed to provide either stand-alone operation (as required in a DSNG application), multiple sources multiplexing, when up to four encoders can be cascaded together, or in a multi-encoders array for statistically multiplexed transport streams.

The E-1000 MPEG-2 Encoders are fully DVB compliant, allowing for installation into hybrid networks that include third party DVB-compliant equipment (checked and approved by ISOG and EBU).

Housed in a 1-rack unit slim-line chassis and featuring low power consumption, the E-1000 Series integrates mechanically with the CODICO® product line. Figure 1-1 provides a general view of the E-1000 Series of MPEG-2 Encoder.

Figure 1-1: CODICO® E-1000 Series of MPEG-2 Professional Encoders

The E-1000 Series of MPEG-2 Encoders consists of the following encoders:

- The E-90 Entry Level MPEG-2 Encoder
- The E-900 Industrial MPEG-2 Encoder
- The E-900A Audio Professional Encoder
- The E-1000 Professional MPEG-2 Encoder
- The E-1200 Advanced MPEG-2 Encoder

NOTE

The CODICO® E-1000 Professional MPEG-2 Encoder is used as the encoding section of the CODICO® E-1510 DSNG Exciter. The CODICO® MOD-8610 DSNG Modulator and Up-Converter provides the modulation and up-converting features of the E-1510 DSNG Exciter.

1.1.1. Local and Remote Control Features

The E-1000 Series of MPEG-2 Encoders provides local management from the Encoder's Front Panel or from a local terminal. It can also be remotely controlled over the Ethernet and using SNMP tools (using either a remote terminal or a network management system).

In both cases, the E-1000 series provides the tools for full operation, configuration and redundancy control of stand-alone and multi-encoder systems.

FULL REDUNDANCY MANAGEMENT

The E-1000 Series supports full modulator or multiplexer redundancy via double ports of either 2 x 270 MHz ASI or 2 x RS-422 interface. This ensures a constant alternative path for the output signal.

When the E-1000 Series of Encoders are connected in a multi-encoders/multi-program system, the CODICO® NMS-4000 Network Management System monitors the system components. If a problem arises at any point in the system, the NMS-4000 switches between redundant encoders, multiplexers or modulators to ensure an alternative path for the output signal.

USER FRIENDLY LOCAL MANAGEMENT

Initial setup and local operation of the E-1000 Series Encoders is quick and easy, with intuitive menu-driven software, viewed on an LCD and controlled locally by front panel pushbuttons. 10 pre-programmed setups can be stored to save time in configuring the encoder. The compact flash card port in the E-1000 front panel is used for software and configuration updates.

SNMP LOCAL AND REMOTE MANAGEMENT

The E-1000 Series Encoders are provided with the capability for local or remote monitoring and management from a terminal connected to the encoder and using industry standard SNMP (Simple Network Management Protocol) tools.

The SNMP tools are also used to provide remote monitoring and management functions between a management station and a multi-encoder based system for the CODICO® NMS-4000 Network Management System.

The Ethernet port is also used for network connection to receive software and configuration updates.

1.1.2. Statistical Multiplexing Capabilities

The E-1000 series support statistical multiplexing for a multi-encoder based system. The statistical multiplexing (stat-mux.) feature calculates and sets the allocation of dynamic and/or static access priority to incoming signals according to required picture quality/video rate. These calculations set the optimal picture encoding level to provide a constant multiplexed transport stream for best usage of the bandwidth while providing the optimal picture on each channel.

Two levels of statistical multiplexing are supported by the CODICO® DVB line:

- Basic statistical multiplexing, using the CODICO® SM-3000 Statistical Multiplexer.
- Advanced statistical multiplexing, implemented by the Scopus developed TripplePass™ Statistical Multiplexing concept.

CODICO® SM-3000 STAT-MUX BASED STATISTICAL MULTIPLEXING

Using the CODICO® SM-3000 Statistical Multiplexer in an E-1000/E-900 based multi-encoder system provides allocation and access priority to the incoming signals for optimal picture encoding level to provide a constant multiplexed transport stream at the output of a multi-input/multi-output multiplexing unit, based on the CODICO® RTM-3800 DVB Multiplexers.

TRIPPLEPASS™ BASED STATISTICAL MULTIPLEXING

Advanced statistical multiplexing is provided by the Scopus developed TripplePass™ Statistical Multiplexing concept. It is a 3 steps parallel approach, securing best encoding and multiplexing mechanism in multi-encoder environment.

The Scopus TripplePass™ concept uses the Pre-Processing and Look Ahead (PLA™) dual encoder architecture featured in the CODICO® E-1200 Advanced MPEG-2 Encoder. This architecture provides advanced pre-processing capabilities, including picture smoothing, dynamic noise reduction and picture re-sizing for best bit per pixel compression.

It also provides look-ahead capabilities consisting of compression complexity estimation and advanced statistical multiplexing using the CODICO® SM-3010 TripplePass™ Statistical Multiplexer for best picture encoding in a multi-program transport stream multiplexing unit. This multiplexing unit is implemented by either the CODICO® RTM-3800 Line of DVB Multiplexers or by the new CODICO® IVG-7300 Intelligent Video Re-Multiplexer.

The TripplePass™ statistical multiplexing system is managed by the CODICO® NMS-4000 Network Management System.

Figure 1-2: RTM-3800 Based Tipple Pass™ Stat Mux Application

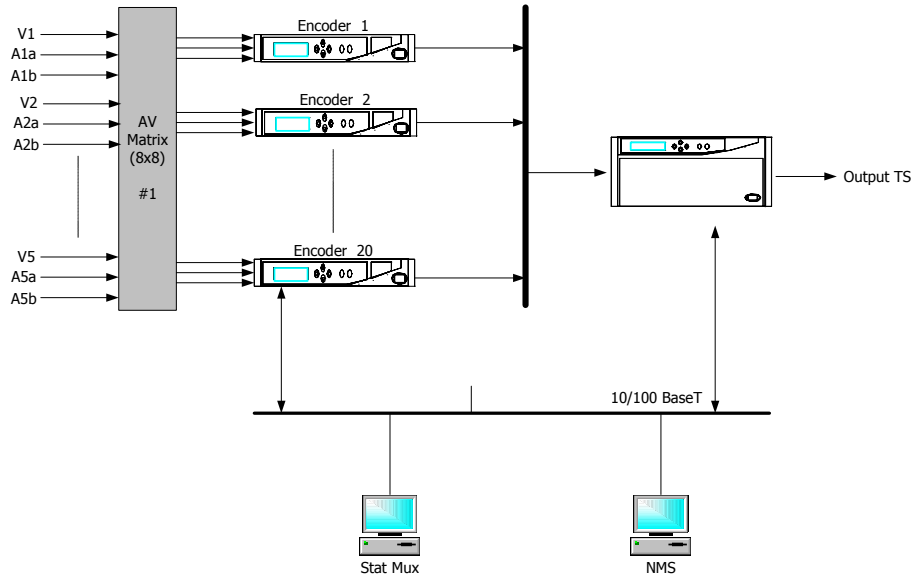
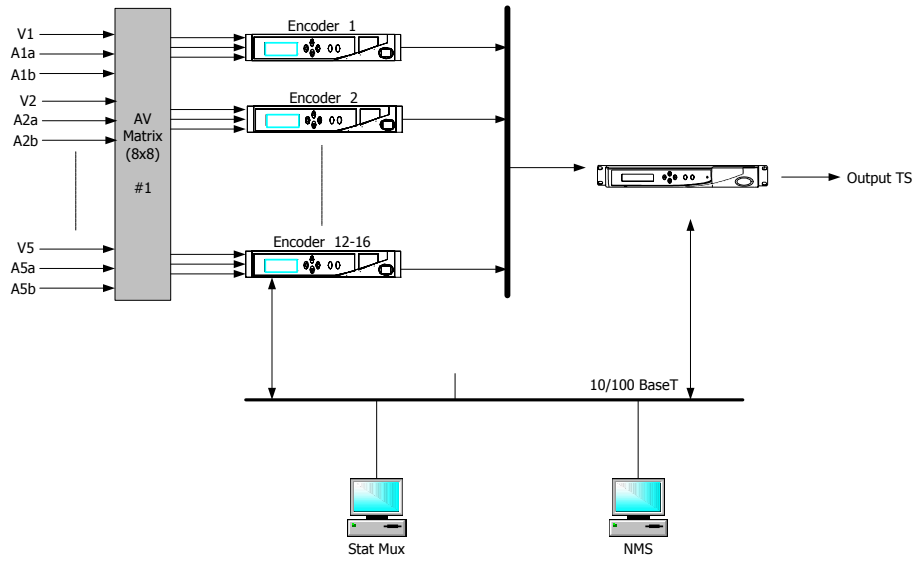


Figure 1-3: IVG-7300 Based Tipple Pass™ Stat Mux Application



1.1.3. Additional Highlights and Benefits

Video Interfaces

The E-1000 Series of MPEG-2 Professional Encoders provides Analog to Digital interface and serial digital interface for mixed analog and digital inputs:

- Analog video input, using the Composite/Component Video Input Module.
- Mixed analog and digital inputs, using the Composite/SDI Option Card.
- Serial digital video input, by installing the SDI Option Card.
- Composite and S-VHS analog video input, by installing the Composite Options Card.

MPEG-2 Encoding Profiles

The MPEG-2 Professional Encoders support the following encoding profiles:

- 4:2:2 Professional Profile @Main Level
- 4:2:0 Main Profile @Main Level

Audio Interface

The 1000 Series Encoders provides up to 4 stereo (8 mono) audio channels. Each channel provides left/right analog or AES/EBU-2 digital interfaces for audio information.

Dolby Profiles

The E-1000 Series provides the following Dolby Digital supported features for the audio channels:

- AC-3 / 2.0 Dolby Digital encoding.
- Dolby 5.1 pass-through profile.
- Dolby-E pass-through profile.

Teletext and VBI Processing

The E-1000 Series features advanced Teletext and VBI processing capabilities.

Frame Synchronization

The E-100 Series offers frame synchronization, which ensures recovery of sync timing in cases of video signal dropouts.

Digital Noise Reduction

The E-1000 MPEG-2 Encoder Series optionally provides Digital Noise Reduction (DNR). The DNR further improves video quality in the E-1000 Series by filtering out flicker noise and random noise typically found in video material of low-level quality.

The E-1200 features advanced DNR, using adaptive and temporal filters for active noise reduction, sync-cut detection for I-frame insertion, and buffer control to further improves full content picture smoothing.

Low and Ultra Low Latency (Delay) Mode

The Low Delay (or low latency) Mode provided by the E-1000 series, offers a quick end-to-end response time to enhance two-way transmissions for DSNG and Live Interviews and is available for both 4:2:0 and 4:2:2 DVB compression standards.

The Ultra Low Delay Mode offers for the 4:2:2 compression standard an ultra low end-to-end response time of up to 150 mSec.

DVB Scrambling Module

The E-1000 Series provides an optional, factory installed, DVB Scrambling module to support BISS (DSNG-CA) Scrambling for BISS MODE 1 and BISS-E type DSNG applications.

The module also provides build-in proprietary scrambling for connection to CAS-5000 based systems or for encoder-based encryption.

1.1.4. Applications

The E-1000 Series Encoders can be implemented in a wide range of applications. Below are some of the typical uses for the E-1000 Series Encoders.

- Standard digital TV distribution, 4:2:0 profile
- Professional digital TV distribution, 4:2:2 profile
- Digital Satellite News Gathering, 4:2:2 profile
- Direct Satellite Broadcast
- CATV digital head-ends
- Distribution over telecom channels
- Private networks
- Video On Demand
- Cascading
- Encryption and Scrambling

Figure 1-4 through Figure 1-7 illustrate several system applications for the CODICO® E-1000 Series Encoders.

Figure 1-4: Audio and Video Distribution System Application

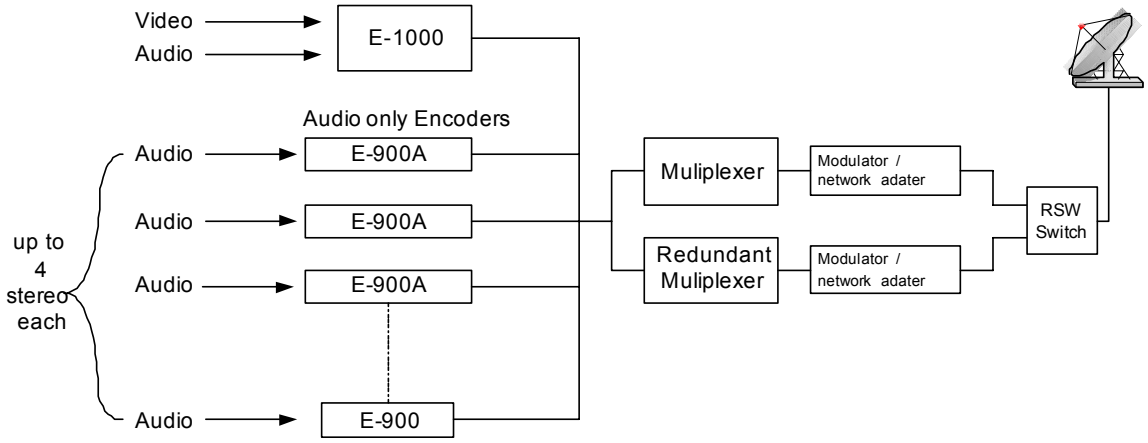


Figure 1-5: Video Distribution System Application

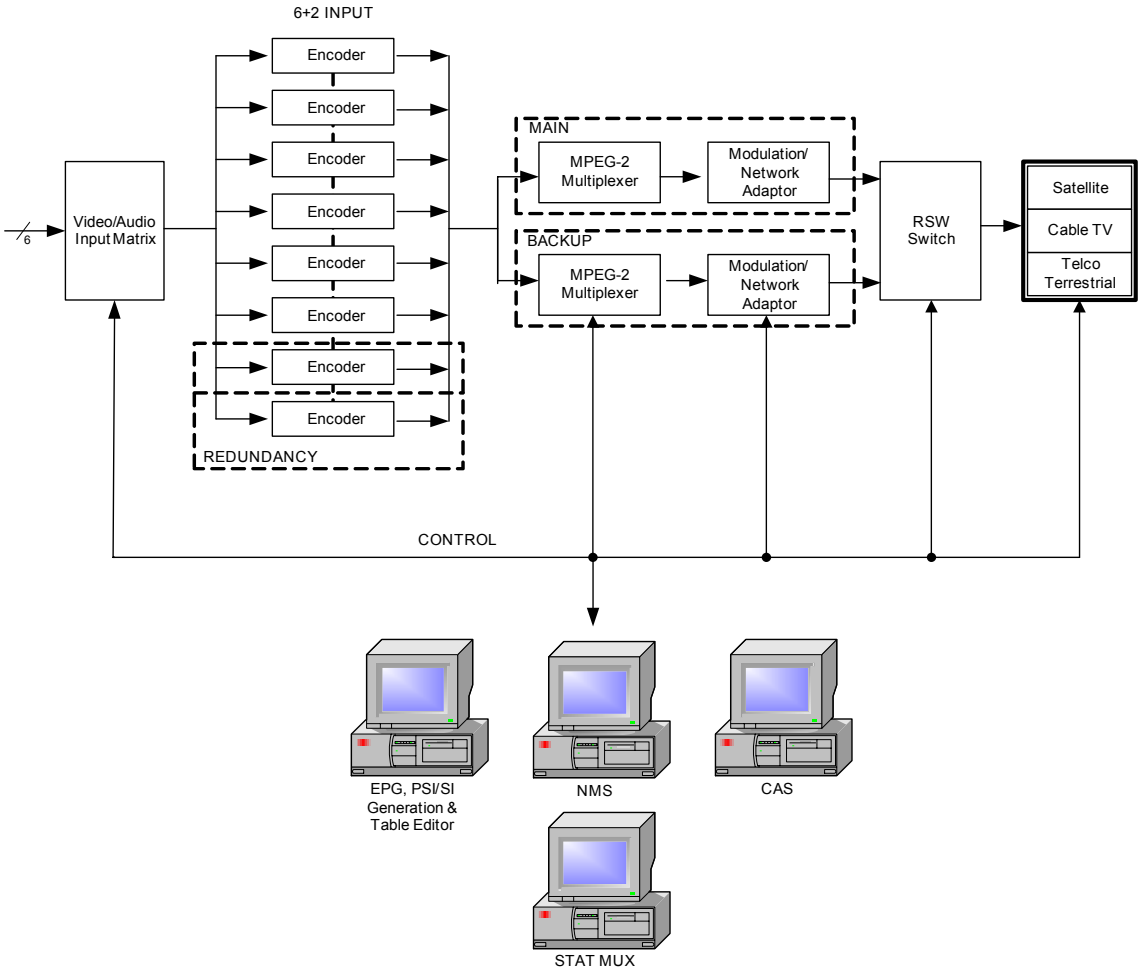


Figure 1-6: Video Over ATM Application

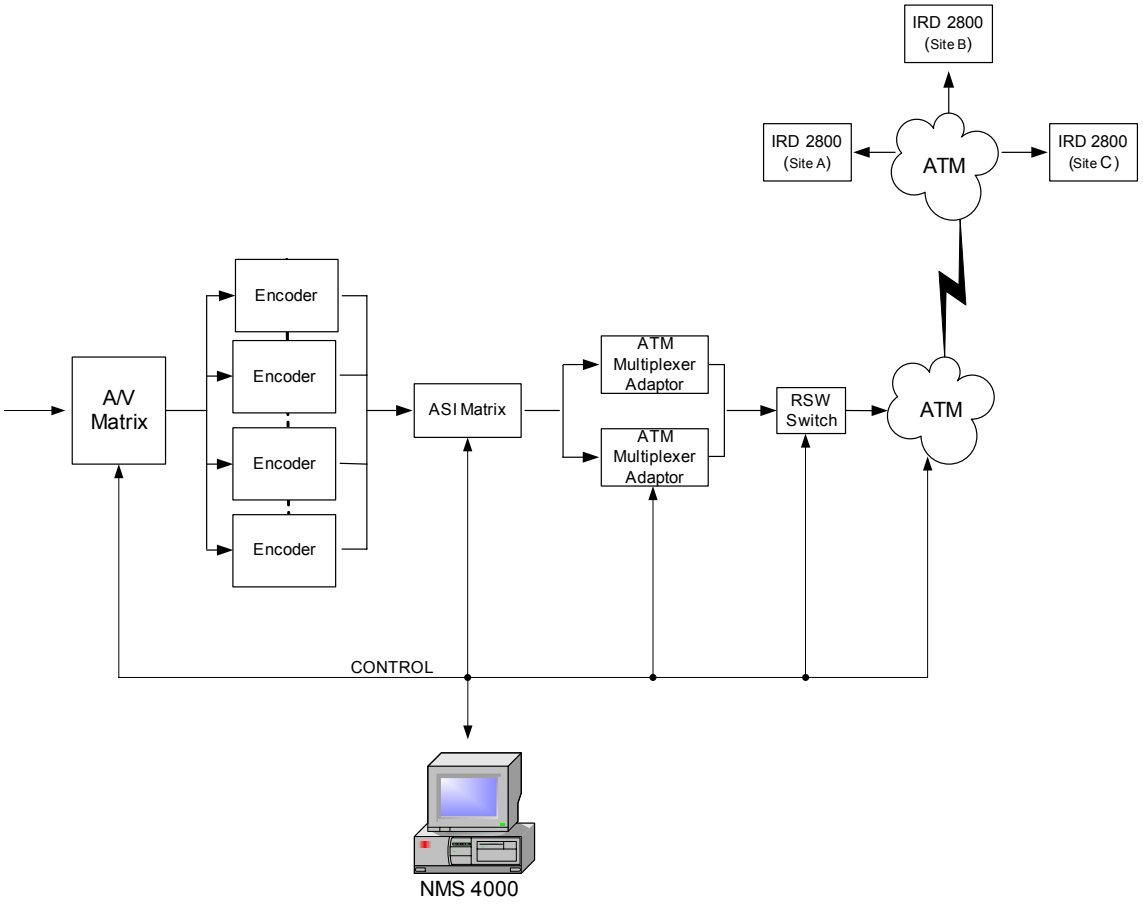
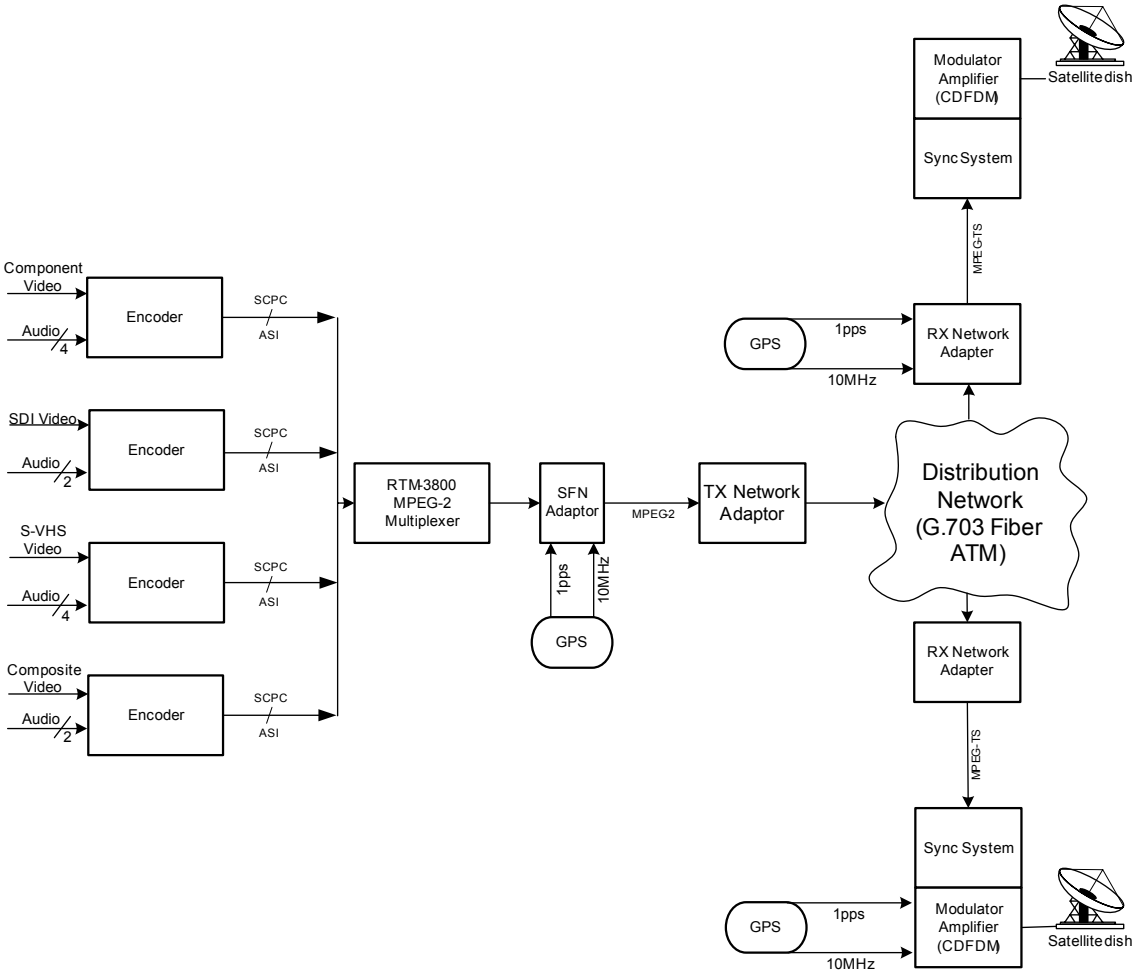


Figure 1-7: Digital Terrestrial Distribution Application



1.2. BASIC AND CUSTOM CONFIGURATIONS

NOTE

As with all other CODICO® family products, the E-1000 Series Encoders feature customization for application-specific implementations. Contact Scopus Network Technologies Technical Support for your particular system requirements.

1.2.1. E-90 Basic Configuration

The basic configuration of the E-90 features the following:

- DVB Video Compression: 4:2:0, up to 8 Mbps and up to full D1.
- Analog VBI Processing: Teletext, CC, VPS, WSS, VITC
- Analog Video Input: Composite, 10-bit A/D, Basic TBC
- Audio Input: 2 * Channels, configurable analog / digital
- Low Speed Data (LSD): Up to 115.2 Kbaud.
- TS Output Interface and Rate: 2 * ASI and 2 * RS-422 transport stream
- Alarm output: GPI, configurable
- Local Control Front Panel Control, 10 Pre-programmed setups

1.2.2. E-900 Basic Configuration

The basic configuration of the E-900 features the following:

- DVB Video Compression: 4:2:0, up to 8 Mbps and up to 2/3 D1.
- Analog VBI processing: Teletext, CC, VPS, WSS, VITC
- Analog Video Input: Composite, 10-bit A/D, basic TBC
- Audio Input: 2 * Stereo audio channels, configurable analog / digital
- Low Speed Data (LSD): Up to 115.2 Kbaud.
- High Speed Data (HSD): Up to 2 Mbps
- TS Output Interface and Rate: 2 * ASI and 2 * RS-422 transport stream up to 25 Mbps
- Latency Mode: 4:2:0 Low latency delay mode
- Alarm output GPI, configurable
- Local Control Front Panel Control, 10 Pre-programmed setups

1.2.3. E-900A Basic Configuration

The basic configuration of the E-900A features the following:

- Audio Input: 4 * Stereo audio channels, configurable analog / digital
- Low Speed Data (LSD): Up to 115.2 Kbaud.
- High Speed Data (HSD): Up to 2 Mbps
- TS Output Interface and Rate: 2 * ASI and 2 * RS-422 transport stream up to 25 Mbps
- Latency Mode: 4:2:0 Low latency delay mode
- Alarm output GPI, configurable
- Local Control Front Panel Control, 10 Pre-programmed setups

1.2.4. E-1000 Basic Configuration

The basic configuration of the E-1000 features the following:

- DVB Video Compression: 4:2:0, up to 50 Mbps and up to full D1.
- Analog VBI processing: Teletext, CC, VPS, WSS, VITC
- Analog Video Input: Composite, 10-bit A/D, basic TBC
- Audio Input: 2 * Stereo audio channels, configurable analog / digital
- Low Speed Data (LSD): Up to 115.2 Kbaud.
- High Speed Data (HSD): Up to 20 Mbps
- TS Output Interface and Rate: 2 * ASI and 2 * RS-422 transport stream up to 25 Mbps
- Latency Mode: 4:2:0 Low latency delay mode
- Alarm output GPI, configurable
- Local Control Front Panel Control, 10 Pre-programmed setups
- External Control Remote NMS-4000
Support for external SNMP control (MIB available)

1.2.5. E-1200 Basic Configuration

The basic configuration of the E-1200 features the following:

- TripplePass™ Support — Supports statistical multiplexing based on Scopus TripplePass™ Technology
- PLA™ Capability — Dual encoding architecture provides pre-processing and look ahead (PLA™) capability for complexity estimation.
- DVB Video Compression: — 4:2:0 / 4:2:2, up to 50 Mbps and up to full D1.
- Video Input: — Analog (Composite), Digital (SDI)
- VBI processing: — Teletext, CC, VPS, WSS, VITC (Analog and Digital)
- Audio Input: — 2 * Stereo audio channels, configurable analog / digital
Dolby AC-3 5.0 Pass through
- High Speed Data (HSD): — Up to 20 Mbps
- TS Output Interface: — 2 * ASI and 2 * RS-422 transport stream up to 25 Mbps
- Alarm Indications — Via NMS
- External Control — Remote NMS-4000 control
Support for external SNMP control (MIB available)

1.2.6. E-1000 Series Custom Options

Table 1-1 lists the options available for customized configurations of the E-1000 Series of MPEG-2 Professional Encoders.

Figure 1-8 illustrates the mechanical layout inside the E-1000 Series (all models) and clarify the combination of options that can be selected.

Table 1-1: E-1000 Series Configuration Options

OPTION	OPTION DESCRIPTION	E-90	E-900	E-900A	E-1000	E-1200
OPT 001	SM-3000 or SM-3010 Statistical Multiplexing Support	**N/A**	**N/A**	**N/A**	**Option**	**Built-In**
OPT 002	Upgrade 4:2:0 to 4:2:2	**N/A**	**N/A**	**N/A**	**Option**	**Built-In**
OPT 003.1	SDI Input instead of the Analog Inputs, TBC and Frame Sync	**Option**	**Option**	**N/A**	**Option**	**N/A**
OPT 003.2	SDI Input in addition to the Analog Inputs, TBC and Frame Sync	**Option**	**Option**	**N/A**	**Option**	**Built-In**
OPT 004.1	2 x G.703 Outputs (E1 or E2), No FEC, Unframed	**N/A**	**Option**	**Option**	**Option**	**N/A**
OPT 004.2	2 x G.703 Outputs (E1 or E2), With FEC, Unframed	**N/A**	**Option**	**Option**	**Option**	**N/A**
OPT 005	DVB Scrambling + BISS DSNG-CA	**N/A**	**Option**	**Option**	**Option**	**N/A**
OPT 006	VBI over SDI	**N/A**	**Option**	**N/A**	**Option**	**Built-In**
OPT 007	Encoder Cascading (RS-422)	**N/A**	**Option**	**Option**	**Option**	**N/A**
OPT 008	-48 Volt Power Supply (instead of 110/220 Volt)	**Option**	**Option**	**Option**	**Option**	**Option**
OPT 009	Built-in Modulator Control (for the CODICO® MOD-8610 Modulator)	**N/A**	**N/A**	**N/A**	**Option**	**N/A**
OPT 012	3rd and 4th Stereo: Analog/ AES/EBU (SP-DIF) + Embedded	**N/A**	**Option**	**Built-In**	**Option**	**N/A**

Table 1-1: E-1000 Series Configuration Options

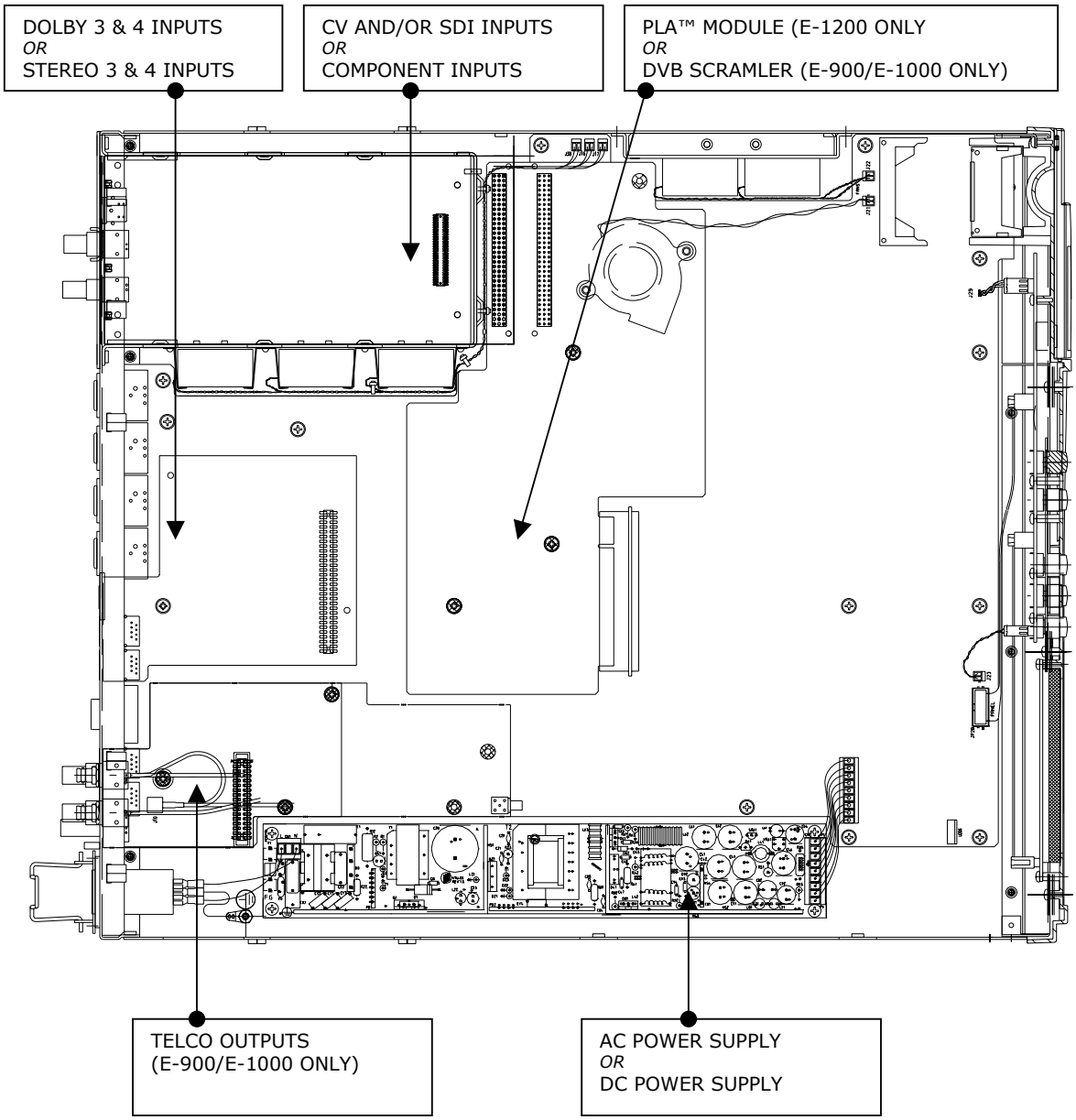
OPTION	OPTION DESCRIPTION	E-90	E-900	E-900A	E-1000	E-1200
OPT 013.1	DS-3 Leased-line connection (ATM AAL-1 protocol)	**Option**	**N/A**	**Option**	**Option**	**N/A**
OPT 013.2	E3 Framed, no FEC	**Option**	**N/A**	**Option**	**Option**	**N/A**
OPT 014	AC-3 Pass-through	**Option**	**Option**	**Option**	**Option**	**Built In**
OPT 015	3rd ASI Output	**N/A**	**Option**	**N/A**	**Option**	**N/A**
OPT 016	ASI Input	**N/A**	**N/A**	**Option**	**Option**	**N/A**
OPT 018	Low Delay Mode (4:2:2 Only)	**N/A**	**N/A**	**Option**	**Option**	**N/A**
OPT 019	Dolby AC-3 / 2.0 Encoding	**Option**	**N/A**	**Option**	**Option**	**Option**
OPT 020.1	Dolby-E Pass-Through	**Option**	**Option**	**Option**	**Option**	**Option**
OPT 020.2	Linear Audio	**Option**	**Option**	**Option**	**Option**	**Option**
OPT 021	DNR, FrameSync, TBC, Component Input (in addition to Composite Input)	**N/A**	**N/A**	**N/A**	**Option**	**N/A**

NOTES

Only one option can be selected for each location:

1. *OPT 004, 005, 008, 012, 013, are factory pre-set.*
2. *OPT 004 and OPT 005 are interchangeable*
3. *OPT 015 and OPT 016 are interchangeable*
4. *Only one ASI Output available with OPT 005 and OPT 013*
5. *OPT 004 (E1 or E2) is provided with 2 * G.703 unbalanced outputs. OPT 004 for E1 may be ordered with 1 balanced and 1 unbalanced output.*
6. *FEC in option OPT 004 and OPT 013 relates to FEC according to DVB-C standard (ETS-300-329). ATM protocol includes its own error correction.*
7. *OPT 006 requires OPT 003 and/or OPT 012, accordingly*
8. *OPT 015 eliminates OPT 004 and OPT 013*
9. *OPT 016 eliminates OPT 004 and OPT 013*
10. *OPT 016 instead of OPT 007*

Figure 1-8: E-1000 Series of MPEG-2 Encoder - Layout and Option Location



1.3. ARCHITECTURE AND FUNCTIONAL DESCRIPTION

The E-1200 Advanced MPEG-2 Encoder features advanced pre-processing and complexity estimation ("look ahead") encoding capabilities to enhance multi-encoding systems performance and to compress low-bit rates at single channel environment (in the near future). This pre-processing and look ahead (PLA™) capability is part of the TriplePass™ Encoding and Statistical Multiplexing concept introduced by Scopus.

1.3.1. Scopus TripplePass™ Concept

The Scopus TripplePass™ Encoding and Statistical-Multiplexing Mechanism (patent pending) is the ultimate solution in advanced encoding mechanism and statistical multiplexing techniques, providing the best class picture quality at a very low average bit rate and offering as much as 18 channels per satellite transponder.

The TripplePass™ mechanism is a three steps parallel approach, taken to ensure the best encoding and multiplexing mechanism in a multi-encoder environment. The first two encoding passes are performed in a single encoder environment, whilst the third pass is operated in a multi-encoder environment.

PRE-PROCESSING- FIRST PASS

With the first pass, the encoder performs full content picture smoothing, dynamic noise reduction using adaptive and temporal filters, sync-cut detection for I-frame insertion and buffer control. Moreover, depending on bit rate budget, picture re-sizing is considered to find the appropriate bit per pixel compression. This initial pass process enables the encoder to optimize the second pass encoding and thus improve the picture quality.

COMPLEXITY ESTIMATION - SECOND PASS

The Complexity Estimation determines the best encoding process for each picture. A Pre-processing and Look Ahead (PLA™) process is used to predict the relative complexity of each picture in order to enable the third pass to allocate the bit rate such that almost equal quality will be maintained within the various picture and the various programs.

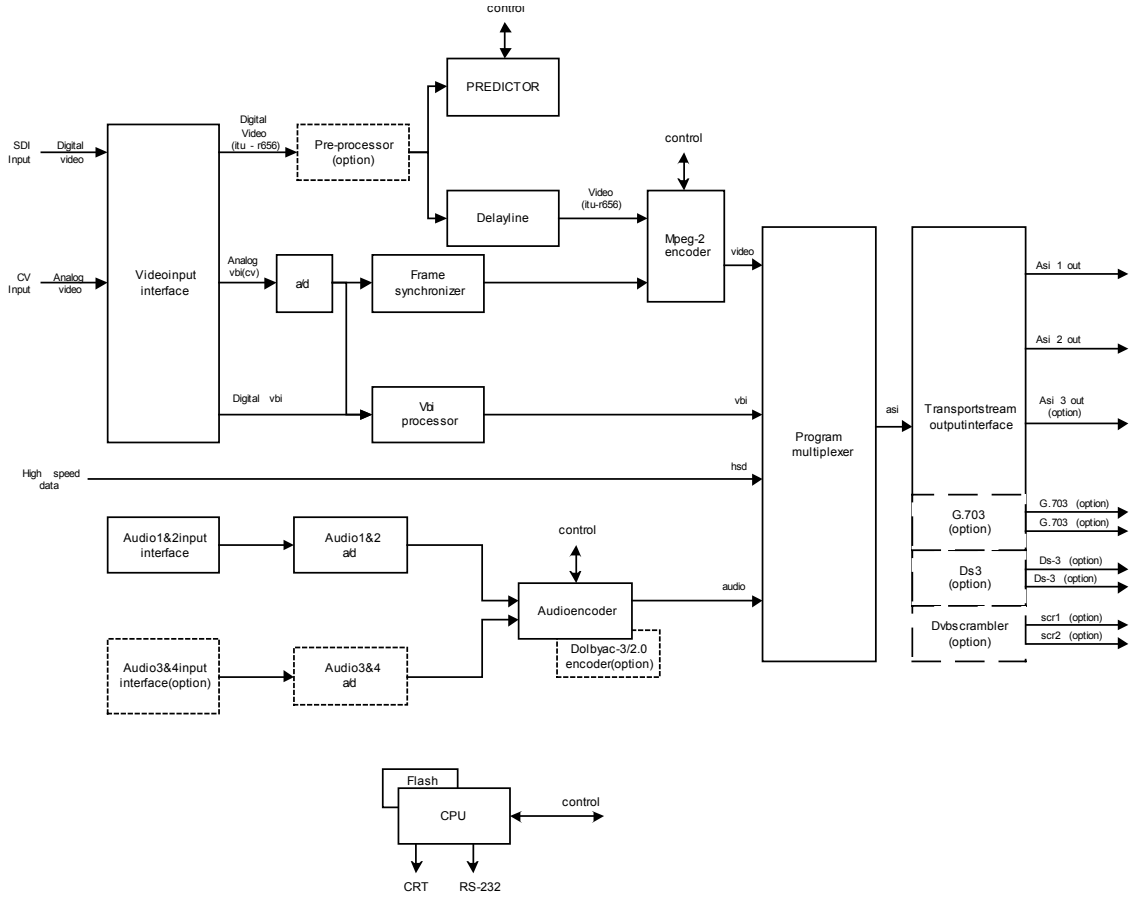
STATISTICAL MULTIPLEXING - THIRD PASS

The statistical multiplexing algorithm is executed in a multi-program environment. The process is provided in conjunction with the CODICO® SM-3010 Advanced Statistical Multiplexer. The SM-3010 manages and controls each encoder output buffer optimizing the encoder VBR operating mode and utilizing each of the program's statistics.

1.3.2. Block Diagram Description

The block diagram in Figure 1-9 illustrates the signal processing pathways in the E-1000 Series of MPEG-2 Encoders.

Figure 1-9: E-1000 Series, Functional Block Diagram



Analog and digital video information, together with VBI data, are received by the video input interface. This information is first pre-processed and than encoded for output. Pre-processing includes A/D conversion (for the analog data), filtering, and frame synchronization as well as optional Digital Noise Reduction (DNR) and Advanced Time Base Correction (TBC). An MPEG-2 Encoder encodes the pre-processed information.

The E-1200 Advanced MPEG-2 Encoder features an optional Pre-Processing function which provides advanced Digital Noise Reduction (DNR) and picture/signal smoothing capabilities to enhance the encoding condition with minimum loss of information and picture quality.

The MPEG-2 encoding in the E-1200 features a dual encoding architecture enabling advanced pre-processing and look-ahead (PLA™) complexity estimation. This architecture consists of a Predictor element (first encoding level) and an MPEG-2 Encoder (second level).

- The Predictor monitors and gathers the statistics of the incoming frames and provides frames complexity estimation using reference parameters. It predicts the encoding level required based on analyzing the picture dynamic behavior (sport scenes versus static scenes). A Delay Line holds the incoming frames until the estimation process is completed to compensate for time-delays during the process. This Delay Line provides up to 2 Sec. delay for best encoding prediction.
- The MPEG-2 Encoder receives from the Predictor the per-frame compression parameters. It calculates the optimal encoding parameters and sends back to the Predictor. During the estimation pass, the actual bit rate is measured and compared to the required bit rate.

Analog (mono and stereo) and digital (AES/EBU) Audio input information is received from up to four stereo inputs and provided to the Audio MusiCam encoder. Optional two inputs (replacing Audio In-3 and In-4) provides AC-3/2.0 Dolby digital encoding as well as Dolby 5.1 and Dolby-E pass-through.

The encoder is equipped with separate Synchronous RS-422 and Asynchronous RS-232 ports, for HSD and LSD, respectively. Both methods of data transfer are uni-directional and may be used concurrently.

A Program Multiplexer receives the processed MPEG-2 video information, the Audio processed information together with VBI and data from the HSD line and generates the SDI output transport stream.

1.4. MECHANICAL STRUCTURE

1.4.1. Enclosure

The E-1000 Series Encoders are housed in a ruggedized industrial enclosure, 1 U by 19" (Rack Mount). Featuring heat dissipation capabilities, the E-1000 Series Encoders may be installed without the necessity for spacing between units. This allows increased flexibility for installing a large number of encoders in limited-space environments.

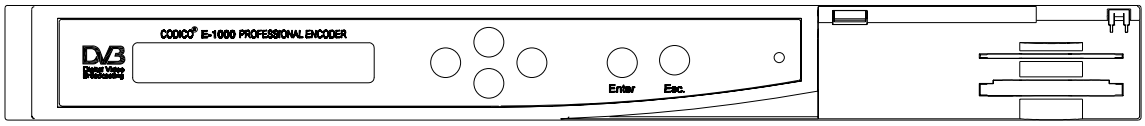
1.4.2. Front Panel

The front panel of the E-1000 Series Encoders has a compact, slim-line design (See Figure 1-10).

For manual control of the encoder, a four-way touch pad provides access to parameter menus displayed in the LCD window. An entry is completed with the Enter and/or Escape touch pads.

A compact flash card port at the right end of the front panel is used for software upgrades and storing encoder configurations.

Figure 1-10: E-1000 Series Encoder - Front View

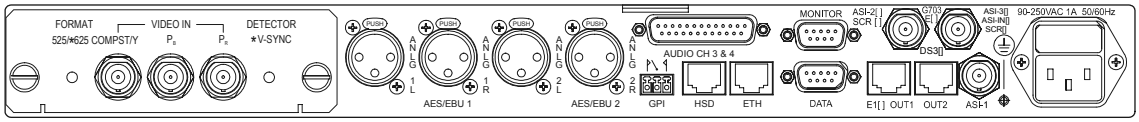


1.4.3. Rear Panel

The rear panel of the E-1000 Series Encoders includes all of the required professional input/output connectors (Audio, Video, Monitor, Ethernet, High Speed Data), eliminating the need for additional connector panels on the rack. The AC connector and power switch are also located on the rear panel.

Figure 1-11 shows a standard E-1000 Series rear panel.

Figure 1-11: E-1000 Series Encoder - Rear View



The rear panel connectors and interfaces are grouped in the following functional categories:

- Encoder Video Input Interfaces, refer to paragraph 1.4.4.
- Encoder Audio Input Interfaces, refer to paragraph 1.4.5.
- Encoder Data Input Interfaces, refer to paragraph 1.4.6.
- Encoder Output Interfaces, refer to paragraph 1.4.7.
- Encoder Control Interfaces, refer to paragraph 1.4.8.

Table 1-2 describes the function of each connector on the panel (including options).

Table 1-2: Encoder Typical Connector Interfaces

INTERFACE	DESCRIPTION	CONNECTOR TYPE
ANLG 1 L	Analog Audio-1 left channel.	XLR female
ANLG 1 R AES/EBU1	Analog Audio-1 right channel or Digital AES/EBU-1.	XLR female
ANLG 2 L	Analog Audio-2 left channel.	XLR female
ANLG 2 R AES/EBU2	Analog Audio-2 right channel or Digital AES/EBU-2.	XLR female

Table 1-2: Encoder Typical Connector Interfaces

INTERFACE	DESCRIPTION	CONNECTOR TYPE
AUDIO CH 3 & 4	Optional Analog Audio-3 and 4 Channels or Digital AES/EBU-3 and -4 Channels, deployed over a "D25 type to XLR" adapter cable into four XLR female connectors, or Optional Dolby AC-3 2.0 encoding and/or Optional Dolby E pass-through	25 pin D-Type
GPI	General Purpose Interface for the alarm relay.	GPI
HSD	High Speed Data interface (private data, RS-422 interface).	RJ-45
ETH	For connection to Ethernet networks 802.3.	RJ-45 (Standard)
MONITOR	For connection to a computer or monitor (RS-232 interface).	9 PIN D-type
DATA	For low speed data interface (RS-232 interface).	9 PIN D-type
ASI-1	DVB ASI Output interface.	BNC female 75Ω
OUT 1	Transport Stream Output 1 (RS-422 interface). ***NOTE:*** *When the optional G.703/E1 module is installed, this connector can be used for G.703/E1 Balanced Output.*	RJ-45
OUT 2	Transport Stream Output 2 (RS-422 interface).	RJ-45
Power	For connection to 90-250 VAC, 50/60 Hz mains power supply. A mechanical harnessing device is provided to prevent accidental removal of the AC power cable.	HP

Table 1-2: Encoder Typical Connector Interfaces

INTERFACE	DESCRIPTION	CONNECTOR TYPE
ASI-2, ASI-3	In the standard E-1000 configuration, ASI-2 is provided as a follow-up to ASI-1 while ASI-3 is not connected. In addition, the ASI-2 and ASI-3 connectors are used for a variety of optional interfaces: **DVB ASI-Output Expansion Interface:** ASI-2 and ASI-3 connectors are used to provide additional DVB ASI outputs (requires installation of an optional ASI OUT Expansion card). **DVB ASI Input Expansion Interface:** ASI-3 connector is used to provide a DVB ASI Input (requires the installation of an optional ASI IN Expansion card). **G.703 Interface:** ASI-2 and ASI-3 connectors are used to output G.703 level unbalanced signal (Requires installation of optional G.703 modules for each different output rate): • G.703 / E1: 2,048 Kbps • G.703 / E2: 8,448 Kbps • G.703 / E3: 34,3688 Kbps ***DVB Scrambler:*** *ASI-2 and ASI-3 connectors are used for DVB Scrambled output (requires installation of an optional DVB Scrambling module).*	BNC female 75Ω

1.4.4. Encoder Video Input Interfaces

The E-1000 Series of MPEG-2 Professional Encoders are provided with a wide range of optional video input panels:

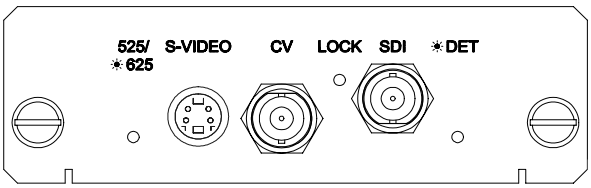
- Composite/SDI Video Input Panel.
- Composite/Component Video Input Panel (E-1000 MPEG-2 Encoder only).

In addition, video from the ASI Input transport stream can also be received from the ASI IN optional interface.

1.4.4.1. Composite/SDI Video Input Panel (Option)

The Composite/SDI Video Input panel for the E-1000 Professional Encoders provides full range of video inputs, including analog super-video (S-VHS) interface, analog composite video (CV) interface and serial digital video interface (SDI). Analog Teletext (and other VBI elements) is provided over CV while digital VBI information is provided over SDI. Figure 1-12 displays the Composite/SDI Video Input Panel.

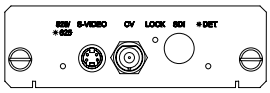
Figure 1-12: Composite/SDI Video Input Panel



Two derivates are also available as optional Video Input Interface panels:

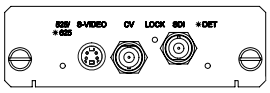
SDI Video Input Panel

The SDI Video Input panel is a sub-set of the Composite/SDI Video Input panel, where the analog composite video interface is not provided and the CV connector is used for analog Teletext over CV input only.



Composite Video Input Panel

The Composite Video Input panel is a sub-set of the Composite/SDI Video Input panel, where the SDI interface is not provided.



NOTE

The E-1200 Advanced Encoder is provided with the Composite/SDI Video Input Panel built-in.

The Composite/SDI Video Input Panel (and the two derives) provides the following controls and indicators:

S-VIDEO *Interface (Mini DIN Connector)*

Input connector for analog composite Super-Video (S-VHS) interface.

NOTE

*The **SDI Video Input Panel Option** does NOT support the S-VHS interface.*

CV *Interface (BNC female, 75Ω Connector)*

Input connector for the analog composite video (CV) interface, including analog Teletext over CV.

NOTE

*The **SDI Video Input Panel** Option does NOT support the analog Composite Video (CV) interface. This input is used to receive analog Teletext over CV data only.*

SDI *Interface (BNC female, 75Ω Connector)*

Input connector for the serial digital interface (SDI) transport stream (video and embedded audio).

NOTE

*The SDI connector and interface are NOT installed on the **Composite Video Input Panel** Option.*

525 / *625 *Indicator (Red/Green LED)*

When illuminated, video input is received. Indicates video format detected:

- **Green Color:**625 lines format
- **Red Color:**525 lines format

LOCK *Indicator (Red/Green LED)*

When illuminated, video is received. Indicates video reception status:

- **Green Color:**Video locked
- **Red Color:**Video NOT locked

DET *Indicator (Red/Green LED)*

When illuminated, video is received. Indicates video synchronization:

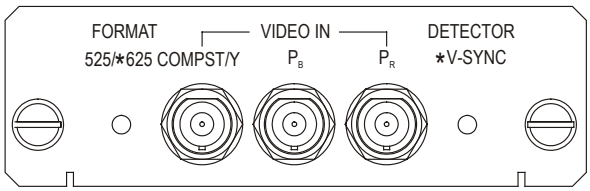
- **Green Color:**V-Sync detected
- **Red Color:**V-Sync NOT detected

1.4.4.2. Composite/Component Video Input Panel (Option)

The Composite/Component Video Input Panel provides interface for analog composite video (CV), including Teletext and other VBI over CV information, as well as analog component video (Y, PB, PR).

The module provides Digital Noise Reduction (DNR) circuitry for signal enhancement. Figure 1-13 displays the Composite/Component Video Input Panel.

Figure 1-13: Composite/Component Video Input Panel



The Composite/Component Video Input Panel provide the following controls and indicators:

VIDEO IN COMPST/Y *Interface (BNC female, 75Ω)*

Input connector for the analog Y element of the component video, or for the analog composite video.

VIDEO IN P_B *Interface (BNC female, 75Ω)*

Input connector for the analog P_B element of the component video.

VIDEO IN P_R *Interface (BNC female, 75Ω)*

Input connector for the analog P_R element of the component video.

FORMAT 525/*625 *Indicator (Red/Green LED)*

When illuminated, video is received. Indicates video format:

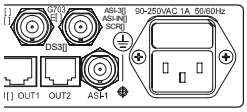
- **Green Color**: 625 lines format
- **Red Color**: 525 lines format

DETECTOR *V-SYNC *Indicator (Red/Green LED)*

When illuminated, video is received. Indicates video synchronization:

- **Green Color:**V-Sync detected
- **Red Color**:V-Sync NOT detected V-Sync detection Indicator:

1.4.4.3. ASI Input Option for Cascading



The optional ASI Input interface enables input for an ASI level transport stream. The main function of the ASI IN interface is cascading the encoder to another slave encoder.

This feature enables cascading at up to 30 Mbps (comparing to the regular cascading over RS-422 interface, up to 20 Mbps effective bit rate). The ASI Input interface is using the ASI OUT-3 connector (BNC type connector).

NOTE

When the ASI Input interface is used, the RS-422 HSD input is disconnected.

1.4.5. Encoder Audio Input Interfaces

The E-1000 Series Encoders features the following audio input options:

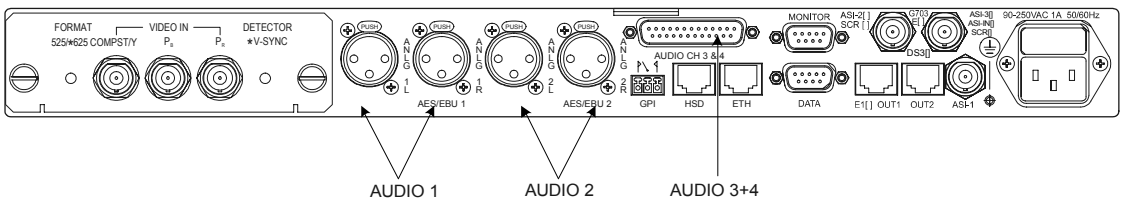
- Stereo Analog Audio Channels, 2 or 4 channels
- Stereo Digital AES/EBU Audio Channels, 2 or 4 channels
- Dolby encoded Digital Audio Channels, 2 channels

NOTE

Stereo Embedded Audio over SDI is provided via the Serial Digital Interface on the Composite/SDI Video Input Panel or the SDI Video Input Panel (refer to paragraph 1.4.4.1).

Figure 1-14 shows the location of the Audio Input connectors on the E-1000 rear panel.

Figure 1-14: E-1000 Audio Input Options



1.4.5.1. Standard Audio-1 and Audio-2 Interface

The standard Audio-1 and Audio-2 Musicam Encoding Interface consist of four XLR connectors, which are used to receive the audio data for Channel 1 and Channel 2, respectively for the Musicam Encoding circuits.

- Analog audio, which requires two connectors for the each analog stereo channel.
- Digital AES/BEU audio, which uses the right XLR connector of the analog channel pair.

1.4.5.2. Optional Audio-3 and Audio-4 Interface

The optional Audio-3 and Audio-4 Interface consist of an Musicam encoding expansion interface card installed inside the encoder and connected by a 25-pin D-type connector on the rear panel.

A deployment cable adaptor, with a 25-pin D-type connector on one side and four XLR connectors on the other side, provides the connections for the Audio-3 and Audio-4 inputs. Each pair of XLR connectors provides analog stereo input or digital AES/BEU input, similar to the Audio-1 and Audio-2 connectors.

1.4.5.3. Optional Dolby-3 and Dolby-4 Interface

The optional Dolby-3 and Dolby-4 Interface consist of a Dolby Digital expansion interface card installed inside the encoder and connected by a 25-pin D-type connector on the rear panel.

A deployment cable adaptor, with a 25-pin D-type connector on one side and four XLR connectors on the other side, provides XLR connections for the Dolby-3 and Dolby-4 inputs.

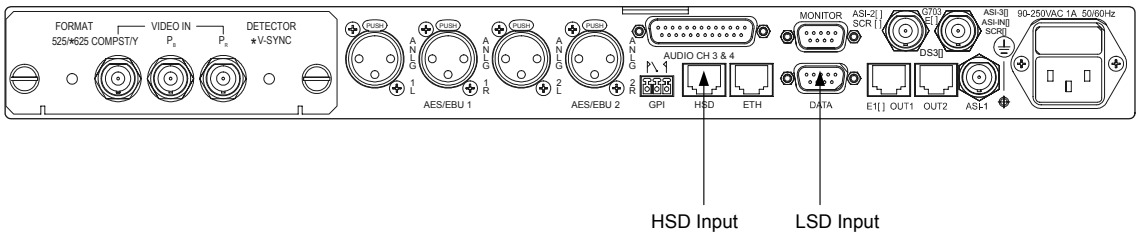
1.4.6. Encoder Data Input Interfaces

The data input for the encoder consists of low-speed and high-speed input data. It is provided on the following interfaces:

- RS-422 High Speed Data (HSD) Input interface,
- ASI IN Input interface,
- RS-232 Low Speed Data (LSD) Input interface

Figure 1-15 shows the location of the Data Input connectors on the E-1000 Series rear panel.

Figure 1-15: E-1000 Series Data Input Options



1.4.6.1. High Speed Data (HSD) Input Interface

The HSD Input interface enables the connection of an external high-speed stream to the encoder. The input is also used in cascading encoders. The HSD interface is provided over a RJ-45 type connector (refer to Figure 1-15).

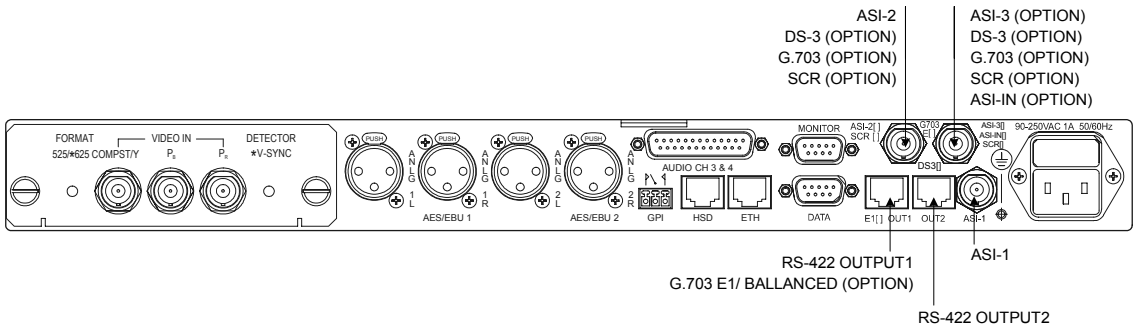
1.4.6.2. Low Speed Data (LSD) Input Interface

The LSD Input interface enables the connection of an external low-speed stream to the encoder. The LSD interface is provided over a D-Type, 9-pin connector (refer to Figure 1-15).

1.4.7. Encoder Output Interfaces

The E-1000 Series Encoders output is normally provided on RS-422 and ASI BNC connectors. With the addition of optional cards, the ASI BNC connectors may provide different outputs depending on the configuration required, including DS-3, G.703 or DVB Scrambled output. Figure 1-16 shows the encoder rear panel with different output interfaces.

Figure 1-16: E-1000 Series Output Options



1.4.7.1. ASI Output Interface Option

The standard ASI-1 and ASI-2 output (BNC type) connectors are provided for ASI transport stream output. A third, ASI-3 output connector is optionally provided by additional hardware.

Different hardware and software enables using ASI-3 connector as ASI Input for reception of ASI level input transport streams.

1.4.7.2. DS-3 Output Interface Option

The DS-3 Output Interface is available as a factory installed option, which supports two DS-3 outputs streams at a physical bit rate of 44.736 Mbps. The interface uses the ASI-2 and ASI-3 connectors, both delivering identical output streams.

NOTE

When using the DS-3 interface option, the output rate can be set up to 37.5 Mbps. Upon changing the rate, the interface will get reset and recover automatically.

The DS-3 option card is based on ATM cells according to the DVB standard ETS300813. The VPI\VCI addresses are factory pre-set for 1\32 and can be modified through the Front Panel Menu options.

1.4.7.3. G.703 Output Interface Option

The addition of a G.703 interface board to the E-1000 Series enables the encoder to support an unframed G.703 interface with or without FEC. The encoder supports G.703 E1, E2 and E3 standards, using different boards. The interface uses the ASI-2 and ASI-3 connectors, both delivering identical output streams.

Balanced G.703 E1 output is provided over the RS-422 OUTPUT1 connector.

FEC is implemented in accordance with the DVB-C algorithm. In order to enable/disable FEC, each of these boards contains a jumper strapping (JP1). Removing the strapping disables FEC.

1.4.7.4. DVB Scrambling Output Interface Option

The addition of a DVB scrambling board, the encoder is able to support Fixed-key DVB scrambling over the ASI BNC outputs. This option is available pre-installed at the factory or as hardware installation by one of the Scopus Network Technologies field-technicians (this installation is not available as an upgrade kit that can be installed by the user).

The E-1000 Series continues to provide Scopus proprietary encoder based encryption, which is enabled on a software level via the terminal interface.

1.4.7.5. RS-422 Output Interface

Two standard RS-422 output connectors (RJ-45 type, see Figure 1-16) provide identical High Speed Data (HSD) output for cascading the encoder to another SLAVE encoder.

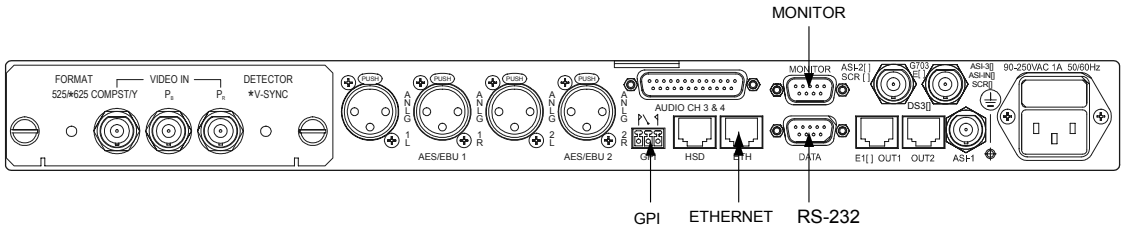
When the G.703 E1 interface is installed, the RS-422 OUTPUT1 (left RS-422) connector can be used to output G.703 E1 / Balanced level data.

1.4.8. Encoder Control Interfaces

The E-1000 Series Encoders provides a wide range of interfaces for local/remote control and monitoring. It includes the following (see Figure 1-17):

- Data Control over RS-232 Interface.
- Ethernet Interface for NMS-4000 control.
- Monitor Output, for connecting an external terminal.
- GPI Interface for status reports.

Figure 1-17: E-1000 Series Control Interfaces Connections



1.4.8.1. RS-232 / DATA Control

The RS-232 / DATA Connector provides RS-232 standard interface (D-Type, 9 pin connector). This interface is used for serial control on the encoder.

NOTES

The communication protocol is available on request.

When using the Data Interface for serial control, Low Speed Data (LSD) is not available.

1.4.8.2. Ethernet Interface

The ETH Ethernet Interface provides access for the CODICO® SM-3000 Statistical Multiplexer or the CODICO® NMS-4000 Network Management System to control and monitor the operation of the encoder. It is also used for the connection of an external MIB browser terminal to control and monitor the operation of the E-1000 Series. The interface is provided over a 10 BaseT / RJ-45 connector.

1.4.8.3. Monitor Output

The MONITOR Output connector provides RS-232 standard interface (D-Type, 9 pin connector, and is used to connect an external Terminal or a Computer to control and monitor the E-1000 Series operation.

1.4.8.4. GPI Interface

The General Purpose Interface (GPI) outputs status and warning messages on the operational condition of the encoder. The GPI information is provided over a GPI connector.

1.5. ENCODER MANAGEMENT

1.5.1. Front Panel Control

An extended control menu tree provides the basic control on the E-1000 Series Encoder. This menu provides configuration, set-up and in-process monitoring functions, activated by the controls and displays on the encoder front panel.

The front panel allows control via a four-way (**UP, DOWN, LEFT, RIGHT**) touch pad, an **Enter** key, and an **Escape** key. Operational commands and parameters are displayed on an Alphanumeric LCD. The four-way touch pad allows scrolling through the menus of the embedded software and parameter modification.

1.5.2. TFTP Interface

The encoder provides a single session TFTP server interface, to enable downloading and uploading of files via port 69 of the TCP/IP protocol stack. The IP address of the encoder can be ascertained from the front panel menus.

CAUTION

THE TFTP SERVER DOES NOT INCLUDE AN AUTHENTICATION MECHANISM. ENABLING THE TFTP SERVER RENDERS THE ENCODER VULNERABLE TO UNAUTHORIZED ACCESS. KEEPING TFTP SESSIONS TO A MINIMUM IS ADVISED TO AVOID UNAUTHORIZED ACCESS.

Client computers installed with Windows NT 4.0 have a TFTP command line installed, which can be found in %SYSTEM ROOT%SYSTEM32.

Operating systems that do not have a TFTP client installed by default can use any TFTP client.

Shareware/Freeware ("Pumpkin") is available to TFTP clients at the following web sites: *http://www.klever.net* and *http://walusoft.co.uk*.

The TFTP server is activated on request from an ANSI terminal using the command: 'tftp'. Once enabled, only the rebooting of the encoder disables the TFTP interface. The TFTP interface is disabled by default.

1.5.3. ASCII

The E-1000 Series Encoders support terminal connection via the rear panel RS-232 interface. Any ANSI terminal program or application can be used.

The terminal interface uses the command structure and syntax supported by the individual program.

1.5.4. SNMP Management

The Simple Network Management Protocol (SNMP) is a standard interface protocol between a manager computer and several agents installed in the users on the network. It provides basic network monitoring and management functions between a management station and managed nodes through applications located on the nodes, called agents.

These agents maintain a database of information (Management Information Base or MIB) about managed nodes and when queried by the manager, retrieve data from the database and send it back to the manager in a response. SNMP over TCP/IP uses UDP packets as its transport for these queries and responses. The management station can be the NMS-4000 or any other terminal, using standard MIB Browser.

The main purpose of the SNMP Manager and Agents is:

- The SNMP Manager monitors and controls information about the nodes on the network.
- The SNMP Agent interfaces between the node and the SNMP Manager.

The SNMP Manager requests the Agent to **get/set** data items identified by Object Identifiers (OIDs) and monitors for **trap** messages generated by the Agent when malfunctions are identified.

The E-1000 SNMP uses two management information bases:

- **MIB2 System Table:** contains general parameters that must to be supported on any SNMP protocol.
- **E1000 Private MIB**: contains parameters unique to the E-1000 Series Encoder.

1.5.5. NMS-4000 Management

When using the NMS-4000 for remote control and management of a system, the E-1000 Series can be configured to automatically announce its presence, by UDP broadcast, to the NMS. The NMS responds by registering the encoder and assuming control thereof and the Front Panel Menus is conditionally disabled.

Prerequisite to remote management is the definition of a local host IP address for the TCP stack of the encoders Ethernet interface. When the NMS and encoder reside on separate subnets, a Gateway (Router) address must also be defined. TCP/IP properties are definable from the front panel menu, using the CONFIG | SERVICE | ADVANCED menu option.

The NMS-4000 uses the SNMP management tools for remote control of the encoder operation.

1.6. CAPABILITIES AND SPECIFICATIONS

1.6.1. Capabilities

Table 1-3 details the capabilities of the E-1000 Series of MPEG-2 Professional Encoders.

Table 1-3: Encoder Capabilities

REQUIREMENT	SPECIFICATION
Preprocessing	Analog Time Base Correction (TBC), Frame Synchronizer
	Automatic Frame Re-sizing
	Advanced Digital Noise Reduction (DNR) over the analog video input (option) Advanced four-level Digital Noise Reduction (E-1200)
	VBI Pre-Processing (Over analog or digital video inputs): • Teletext (WST 625) • Close Capture (CC), Wide Screen Signaling (WSS), Vertical Interval Time Code (VITC), Video Program System (VPS)
Compression and Processing	DVB MPEG-2 Encoding Profile: • E-90/E-900/900A Encoders 4:2:0 Main Profile @ Main Level • E-1000/E-1200 Encoders: 4:2:0 / 4:2:2, Switchable
	Low Delay Mode (at 4:2:0 and 4:2:2). Ultra Low Delay Mode (at 4:2:2 only) down to 150 mSec end-to-end.
	Variable GOP: I, P and B Frames processing
Encoding Rate	4:2:0 Main Encoding Profile:up to 15 Mbps 4:2:2 Professional Encoding Profile: up to 52 Mbps
Data Transfer	Low Speed Data: RS-232 up to 115.2 Kbaud High Speed Data: RS-422 up to 20 Mbps
E-1200 Look Ahead Encoding Evaluation	Look Ahead capability, implemented by dual-encoding architecture: • First encoder functions as a program complexity predictor. • Second encoder functions as the main encoder.
	Enhanced complexity estimation, up to 70 frames.

Table 1-3: Encoder Capabilities

REQUIREMENT	SPECIFICATION
Video Input and Encoding	Video Input Formats: • Digital Input: SDI • Analog Input: S-VHS, Composite (OCMSA) • Components (option)
	Analog Conversion: 10 bit A/D
	Aspect Ratio: 4:3, 16:9 (PAL/NTSC)
	Video Picture Resolution: • Horizontal Resolution: 720, 704, 640,544, 480 pixels/line • Vertical Resolution: 576 (PAL), 480 (NTSC) lines/frame
Audio Input and Encoding	2 Stereo Channels (4 Mono), Option for 4 Stereo Channels (8 Mono)
	Audio Formats: Analog, AES/EBU (option), Embedded (option)
	Audio Mode: Stereo, Joint Stereo, Single Channel, Dual Channel
	Audio Encoding: • Encoding Format: MPEG I layer II, CD quality • Encoding Rate: 64 to 384 Kbps
	Dolby Encoding: • Dolby Digital Encoding (AC-3 / 2.0, option) • Dolby-E Pass-through (option) • Dolby AC-3 / 5.1 Pass-through
Output Transfer Stream	**DVB Interface:** 2 x ASI Output (ASI-3 option), up to 52 Mps
	Telecom G.703 Interface (Option): Unframed PDH at E1, E2 or E3 data rates with/without DVB-C FEC Support
	DVB-PDH Interface (Option): ATM AAL-1 Interface at E3 data rate
	DVB Scrambling (Option): BISS Mode-1, BISS-E scrambling
	High Speed Data transfer over RS-422, up to 20 Mbps

1.6.2. Interface Connections Specifications

Table 1-4 details the input, output and control connection interfaces for the E-1000 Series.

Table 1-4: E-1000 Series Encoders Interfaces

INTERFACE	PROPERTY	SPECIFICATION
INPUT CONNECTION INTERFACES		
SDI Serial Digital Input	Number of inputs	1
	Input data rate	270 Mbps
	Impedance	75 Ω
	Interface	ITU-R 656
Composite Video	Number of inputs	1
	Input Format	PAL-B, -M, -N, -G, NTSC-M
	Impedance	75 Ω
	Interface	ITU-R 624
	Quantization	10 bit
Component Video ***(Y, P_B, P_R)***	Number of inputs	1
	Input Format	Betacam
	Impedance	75 Ω
	Quantization	10 bit
AUX Low Speed Data Input	Type	RS-232 serial interface
	Data rate	2400, 4800, 9600, 19200, 38400, and 115200 bps
AUX High Speed Data Input	Type	RS-422 Interface Synchronous
	Data rate	Up to 20 Mbps

Table 1-4: E-1000 Series Encoders Interfaces

INTERFACE	PROPERTY	SPECIFICATION
AES/EBU Digital Audio	Number of inputs	1 to 2 Stereo or 4 Mono channels. Option for 4 Stereo (or 8 Mono) channels.
	Data format	Serial
	Interface	AES/EBU
Analog Audio	Number of inputs	1 to 2 Stereo or 4 Mono channels. Option for 4 Stereo (or 8 Mono) channels.
	Impedance	600 Ω balanced
	Sampling frequency	32 kHz, 44.1 kHz, 48 kHz
	Quantization	18 bits (SP-DIF)
External Clock Input	Number of inputs	1
	Interface	RS-422
Alarm Relay Interface	1 relay	Normally Open (N.O.) Contact. Monitors Video Fault, Audio Fault, and Temperature Alarm
OUTPUT CONNECTION INTERFACES		
RS-422 Output	Number of outputs	2
	Internal out rate	1 to 20 Mbps*
	Effective output rate	1 to 20 Mbps*
	Data out Interface	RS-422
	Clock out Interface	RS-422
DVB ASI Output	Number of outputs	2 (3 Optional)
	Effective output data rate	1 to 52 Mbps (external clock)
	Physical line rate	270 Mbps
	Impedance	75 Ω
	Output Interface	Hot-Link

Table 1-4: E-1000 Series Encoders Interfaces

INTERFACE	PROPERTY	SPECIFICATION
Telecom G.703 Output (option)	Number of outputs	2
	Physical line rate	2 Mbps (E1), 8 Mbps (E2), 34 Mbps (E3)
	Impedance	75 Ω
	Output interface	G.703 Unframed PDH Data rates: E1, E2 or E3
		G.703 with FEC (optional): DVB-C FEC
DS-3 Output (Option)	Interface	ATM, AAL-1
	Number of outputs	2
	Physical line rate	45 Mbps
	Impedance	75 Ω
	Output interface	G.703 according to ETS 300813 (DVB)
*Output Rate may be further affected depending on cable length.		
CONTROL CONNECTION INTERFACES		
Ethernet NMS Interface (option)	Interface	Ethernet
	Impedance	50 Ω
	Protocol	TCP/IP, proprietary
Serial Comm. Channel	Transmit / Receiver	RS-232, D-type 9-pin Connector
	Data rate	9600 bps (8 bit, No Parity, 1 bit stop)

1.6.3. Physical Specifications

Table 1-5 details the physical specifications of the E-1000 Series Encoders. It includes the mechanical dimensions, electrical requirements and environmental conditions for operational and non-operational modes.

Table 1-5: E-1000 Series Encoders Physical Specifications

PARAMETER	VALUE
E-1000 MECHANICAL DIMENSIONS	
Height	44mm (1.75", 1 U Rack Unit)
Width	483mm (19" Standard Rack)
Depth	530mm (21")
Weight	4.5Kg (9 Lb.)
E-1000 ELECTRICAL REQUIREMENTS	
AC Supply Voltage	90V AC (Min.) to 260V AC (Max.)
DC Supply Voltage	-48V DC (option)
Power consumption	100W (Max consumption)
E-1000 ENVIRONMENTAL CONDITIONS	
Temperature	Operation: 0°C to +50°C Non-operational: -40°C to +70°C
Humidity	Operational: 85% non-condensing at +30°C. Non-operational: 95% non-condensing at +45°C
Vibration and Shock	In accordance with MIL-STD-810D
Altitude	Operational: Up to 10,000 Ft. Non-operational: Up to 50,000 Ft.
Air consumption	40 CFM. Input is from the right side. Output is to the left side. 100mm side clearance required for air movement.

Section 2
INSTALLATION

2.1. GENERAL

This Section describes the procedures required for installing the CODICO® E-1000 Series of MPEG-2 Professional Encoders.

2.2. INSTALLATION INFORMATION

2.2.1. Safety Precautions

To avoid injury and equipment damage, observe the following safety precautions:

- Do not move or ship equipment unless it is properly packed in its original wrapping and shipping containers.
- Only Scopus Network Technologies trained personnel should perform equipment operation, service and maintenance.
- To prevent damage by lightning, ground the unit according to local regulations.

2.2.2. Inventory Check

Before installing the unit, ensure that all the equipment to be installed has arrived (refer to Table 2-1). Check the parts received with the encoder unit for damage.

CAUTION

IF ANYTHING IS MISSING OR DAMAGED, DO NOT CONTINUE WITH THE INSTALLATION.

Table 2-1 E-1000 Series of MPEG-2 Professional Encoders Inventory List

DESCRIPTION	QUANTITY
CODICO® E-90, or E-900, or E-900A or E-1000 or E-1200 MPEG-2 Professional Encoder	1
AC Power Cable (for AC Powered encoders)	1 out of the following options: • European Code Cable (for Euro use) • American Code Cable (for U.S. use) • Power Cable (for other countries use)
DC Power Cable (for DC Powered encoders)	1
E-1000 Series of MPEG-2 Professional Encoders User Manual	1

2.3. MECHANICAL INSTALLATION

2.3.1. Site Preparation Guidelines

The E-1000 Series of MPEG-2 Professional Encoders can be desk or rack-mounted.

GENERAL GUIDELINES

Install the encoder within 1.5m (5 feet) from an easily accessible grounded AC outlet, capable of furnishing the required supply voltage.

As with any other mission-critical electronic device, the use of a UPS (Uninterrupted Power Supply) and an AVR (Automated Voltage Regulation) is highly recommended to ensure proper operation of the encoder.

DESK INSTALLATION GUIDELINES

When placed on a flat surface, leave space at the sides for airflow. Air intake for cooling is from holes at the side of the unit and the fans at the back panel.

RACK MOUNTING GUIDELINES

Confirm that the rack is fully prepared for the installation and that it has been properly grounded.

Leave sufficient space in front and behind the rack to facilitate easy access during installation and maintenance.

2.3.2. Rack Mounting

When mounted in a standard 19-inch equipment rack, mounting brackets must be used to support the device.

CAUTION

TO PREVENT DAMAGE TO THE ENCODER CHASSY, USE FORE AND AFT MOUNTING BRACKETS. ATTACHING THE DEVICE WITH THE FRONT PANEL SCREWS WILL

Prepare the encoder for rack installation according to the following directions:

1. The rack adapter kit includes two mounting brackets. The brackets are fastened with screws on the sides of the encoder housing.

2. Attach each bracket by inserting two screws, with flat washers, in the two front holes at the sides of the housing. Nuts are already in place on the inner side of the holes.
3. After attaching the brackets, the unit is ready for installation in the rack.
4. Fasten the brackets to the side rails of the rack by means of four screws (not included in the kit), two per side.
5. Ensure that proper grounding is provided for the rack assembly to prevent potential electrical problems in the devices mounted on the rack.

2.4. ELECTRICAL INSTALLATION

WARNING

DO NOT CONNECT AC POWER UNTIL YOU HAVE VERIFIED THAT THE LINE VOLTAGE IS CORRECT AND THE PROPER FUSES ARE INSTALLED. FAILURE TO DO SO COULD RESULT IN ELECTRICAL SHOCK.

2.4.1. Compact Flash Installation

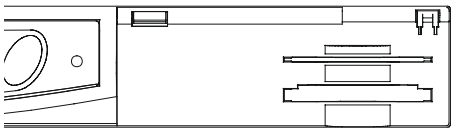
The E-1000 Series encoders are fitted with a Compact Flash Disk that contains the updated software version. The receptacle for the flash disk is located under the cover on the front right side of the encoder (see Figure 2-1).

The Flash Disk should be firmly inserted in to the slot provided to ensure contact.

CAUTION

DO NOT ATTEMPT TO REMOVE OR INSERT THE FLASH DISK WHILE THE ENCODER IS POWERED ON OR INNITIALIZING.

Figure 2-1: E-1000 Series Compact Flash Receptacle



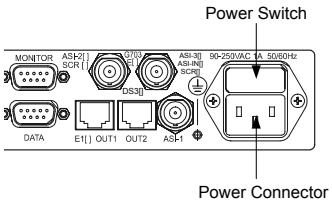
2.4.2. Power and Ground

The E-1000 Series Encoder can be supplied with AC or DC Power Supply. Power and Ground connection for each option is detailed in the following paragraphs.

2.4.2.1. AC Power Supply

The AC Power Cable provides AC power and ground to the encoder.

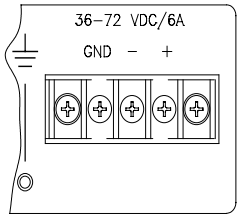
- Connect one end of the cable the power connector at the AC connector.
- Connect the other end to the AC power source.



2.4.2.2. DC Power Supply

The -48 DC power and ground to the encoder is supplied by an external 48 Vdc Power Supplier. The external power supplier connects to the contacts on the power terminal board:

- (+) 48V DC to the (+) contact.
- (-) 48V DC to the (-) contact.
- Grounding point wire to the (GND) contact.



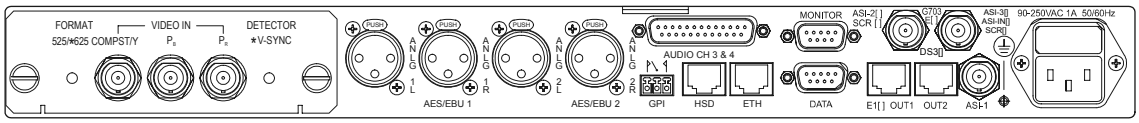
2.4.3. Cabling Connections

All cable connections to the encoder are made via the rear panel. Figure 2-2 shows the rear panel connector interfaces, for different input and output options.

The left section of the panel is exchangeable to accommodate the encoder video option modules (refer to paragraph 1.4.4 for details on the options available).

On the right side of the panel, the BNC connector functionality may provide different outputs depending on the configuration required, including DS-3, G.703 or DVB Scrambled outputs (refer to paragraph 1.4.7 for details).

Figure 2-2: E-1000 Typical Rear Panels - Connectors Location



2.4.4. Encoder Cascading Connections

Cascading encoders provides expansion of the range of inputs. These inputs are encoded to the output of the encoding section in a Head-End DVB system.

The terms MASTER and SLAVE are used in reference to the encoders as follows:

- **MASTER**: the encoder that contains all the cascaded streams.
- **SLAVE**: the encoder that is cascading to the SLAVE "above" it or to the MASTER.

The slave encoders feed their output into the HSD input of the higher-level encoder. Internal algorithms automatically compensate the delay incurred due to the lower bit rate of the HSD interface. These algorithms perform PCR re-stamping on the signal received from the cascade.

The E-1000 Series of MPEG-2 Professional Encoders enables two types of encoder cascading interfaces:

- **RS-422 Encoder Cascading**

  This option uses one of the RS-422 Output connectors on the SLAVE encoder to connect the video data to the HSD RS-422 Input interface of the MASTER (or higher level SLAVE) encoder (see connecting diagram in Figure 2-3).
- **ASI Encoder Cascading**

  This option uses one of the ASI OUT connectors on the SLAVE encoder to connect the transport stream data to the ASI IN Input interface of the MASTER (or higher level SLAVE) encoder (see connecting diagram in Figure 2-4).

NOTES

- *Using the ASI interface enables cascading for faster streams (up to 30 Mbps) than those enabled over RS-422 interface (up to 20 Mbps).*
- *When the optional ASI IN input interface is connected, the standard HSD Input interface is disabled, as both interfaces uses the same stream input processing function of the encoder.*
- *Due to the cascading configuration, changing parameters in one of the slaves can take longer periods of time than for a single encoder.*
- *Both cascading options support up to three SLAVE encoders cascaded to the MASTER encoder.*

CAUTION

THE ORDER OF OPERATION OF THE CASCADING IS VERY IMPORTANT.

REFER TO SECTION 3 FOR SET-UP AND OPERATIONAL INSTRUCTIONS.

Figure 2-3: RS-422 Cascading - Cable Connections

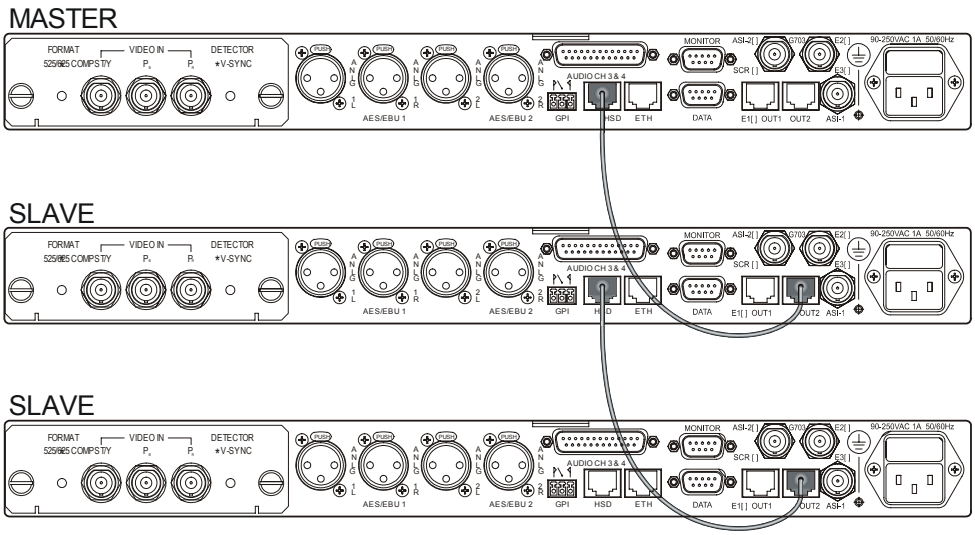
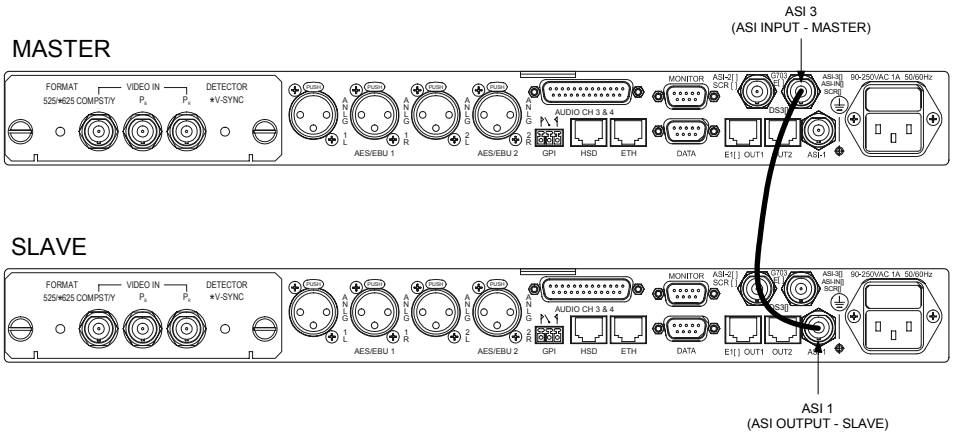


Figure 2-4: ASI Cascading - Cable Connections



2.5. QUICK START

2.5.1. Power Up Sequence

The initialization sequence of the encoder is as follows:

1. Ensure that the Compact Flash is fully inserted into the receptacle located on the front panel.
2. Power the unit ON. The front panel illuminates and the LCD display shows the progress of initialization.
3. Once initialized, the display should show the STATUS OK message.

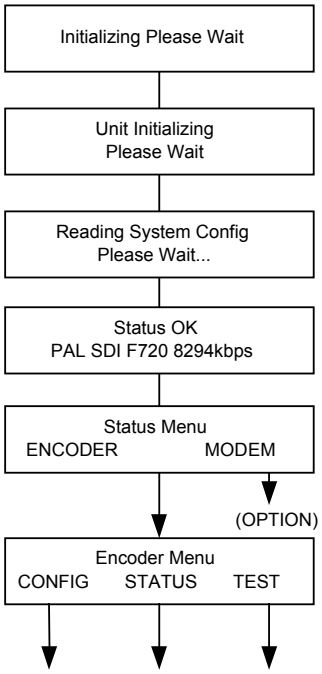
2.5.2. Initialization Sequence

Accesses to system menus for the encoder are made via the System menu.

The E-1000 Series Flow Chart provides an overview of access routes to the menus and sub-menus accessible from the Front Panel of control.

When the E-1000 Series is powered ON, an initialization sequence commences providing verbose status of the device as it retrieves parameters from flash memory.

Successful initialization results in the STATUS OK message being displayed on the LCD, and the encoder is Under Local Control. The Initialization sequence proceeds down to the Status menu, from which all other menus are accessible.



If an error is detected in the encoder, messages are displayed on the LCD Display, as Status Messages and by lightning the Status LEDs (on the encoder front panel).Table 2-2 lists the LCD messages and the LED response to detection of failures and malfunctions in the encoder.

Table 2-2: Encoder Status Messages

LCD DISPLAY MESSAGES	LED STATE
Fail To Comply Messages	
Unit Not Responding	RED LED BLINK
Comm Checksum Error	RED LED BLINK
Unit Busy	GREEN LED BLINK
Illegal Setup	RED LED BLINK
Encoder Warning Messages	
Temp. High >49°C	RED LED BLINK
Ext. Clock Absent	GREEN LED BLINK
Video Input Absent	GREEN LED BLINK
Audio Input Absent	GREEN LED BLINK
Audio Fault	RED LED BLINK
Video Fault	RED LED BLINK
Video & Audio Fault	RED LED BLINK

2.5.3. External Remote Control

If the encoder is set locally for remote control by the NMS-4000, the Status OK message will display **STATUS OK - TCP** (see שגיאה! מקור ההפניה לא נמצא.). In this state, access to the front panel menus is conditionally disabled and control is the responsibility of the NMS-4000.

To regain local control:

1. Press the **[Enter]** button.
   A prompt appears "Set Local Control?"
2. Select **Yes** and press the **[Enter]** button.
   The encoder will reboot with local control restored.

NOTE

Local Control also disables the UDP broadcast used by the encoder to announce its presence on the network.

2.5.4. Initial Configuration

CAUTION

DO NOT REMOVE THE COMPACT FLASH CARD DURING OPERATION!!!

After the physical installation and initialization are complete, the following basic configuration should be performed. This procedure provides only the elementary parameters for simple operation. Use the interactions found in the Operation Section to define the following:

- Setting of the video format
- Setting of the video input
- Setting of the audio input

After configuration, provided the receiver parameters properly match those of the encoder, video monitors should display a picture.

2.5.5. Serviceability Checks

This section describes a set of checks that can be performed in order to determine proper operation of the encoder.

Once initial configuration has been performed, serviceability checks should be done, which consist of the following tests (refer to Section 5:):

- Video Test, refer to paragraph 5.3.2.1.
- Audio Test, refer to paragraph 5.3.2.2.

Section 3
ENCODER FRONT PANEL OPERATION

3.1. INTRODUCTION

This Section provides a detailed description of the CODICO® E-1000 Series of MPEG-2 Professional Encoders operation, using the front panel control menu.

3.1.1. Front Panel Theory of Operation

The operation of the front panel menu is provided to the local operator, using the front panel of the encoder. Figure 3-1 shows the front panel and the control elements on the panel. Table 3-1 describes these elements.

Figure 3-1: Front View of the Encoder

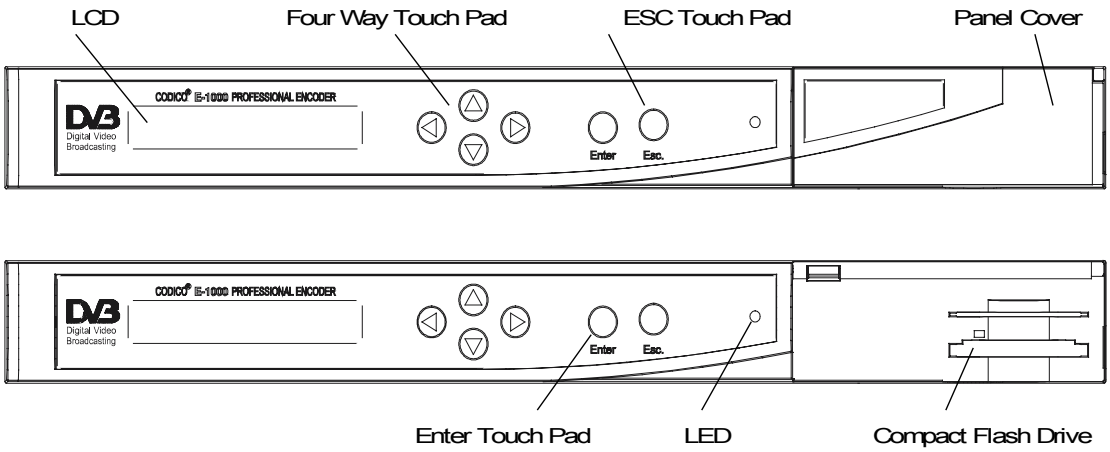


Table 3-1: Front Panel Controls and Indicators

CONTROL ITEM	DESCRIPTION
LCD	The Liquid Crystal Display (LCD) is an alphanumeric display used to display the front panel control menu options, input control parameters and status information. It also displays system data and system status messages.
Four Way Touch Pad	The Four Way (**[Left]** / **[Right]** / **[Up]** / **[Down]**) touch pad enables navigation in the menus by moving UP, DOWN, LEFT or RIGHT, respectively, in the information displayed on the LCD.
Enter Touch Pad	The **[Enter]** touch pad confirms/saves a selection or proceeds to next menu/item.
ESC Touch Pad	The **[Esc]** touch pad exits from the current position or returns to the Status Message at the top of the menus.
Status Indicator LED	The Status Indicator LED uses the following legend: • **Constant Green:** System Initializing and Normal Operation • **Flashing Green:** Service Warning • **Constant Orange:** Bit Stream Warning • **Constant Red:** Hardware Failure Indication is available once the encoder is initialized and corresponds with status messages viewed from the LCD.
Flash Card Receptacle	Mechanical slot for the Compact Flash card

3.1.2. Front Panel Menu - Parameters Management Concept

All encoder parameters can be viewed though the front panel LCD and changed by the touch pads. Managing/Changing a parameter is performed in a three-step (choose, change, save) procedure.

3.1.2.1. CHOOSE Step:

The first step consists of navigating in the menu tree and finding the parameter in the menu. The various encoder parameters are set on a menu tree by categories. The menu tree can be navigated from the touch pad as follows:

- The **[Left]** / **[Right]** touch pads are used to move between the categories. The categories are aligned in a row and the selected category is highlighted.
- The **[Up]** / **[Down]** touch pads are used to move between the parameters under the selected category.
- A category / parameter is selected by pressing the **[Enter]** touch pad.
- The **[Esc]** touch pad returns one level back.

3.1.2.2. CHANGE Step:

The second step changes the current value of the parameter selected. There are two kinds of parameters, differed by the way they are changed:

OPTION LIST PARAMETERS:

The operator selects an option parameter out of a pre-defined list.

- The [Up] / [Down] touch pads are used to select the required parameter.
- [Enter] confirms the new parameter.

NUMERICAL VALUE PARAMETERS:

The operator sets a numeric value/parameter.

- The **[Left]** / **[Right]** touch pads are used to move between the digits.
- The **[Up]** / **[Down]** touch pads are used to change the value of a digit.
- **[Enter]** confirms the new number/value.
- **[Esc]** rejects it and returns to the original numeric value.

3.1.2.3. SAVE Step:

The changes in the encoder take effect only after saving the parameters. Saving the parameters is done as follows:

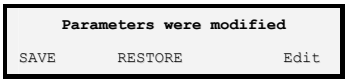
EXIT TO TOP-LEVEL MENU

After all parameters have been modified, exit to the top-level menu by repeatedly pressing the **[Esc]** touch pad.

CONFIRM THE CHANGES

Before the top-level menu appears, the user is required to confirm the changes.

The LCD screen displays the message **`Parameters were modified`** and the options:



- **Save:**
  The changes take effect in the encoder.
- **Restore:**
  The changes are restored to their old values.
- **Edit:**
  Keep modifying the parameters.

Select an option with the **[Left]** / **[Right]** touch pads and confirm selection by pressing the **[Enter]** touch pad.

IMPORTANT

Some of the functions are updated and saved as soon as the configuration change is completed, without the need to perform the save procedure detailed above.

It includes the following configuration set-up options (a specific note is also provided at the option description in the following text):

- Audio Channel Level Option, *refer to paragraph 3.2.4.3 for details.*

- A/D Factory Default Setup Option, *refer to 3.2.10.1 for details.*

- A/D Luminance Gain Option, *refer to 3.2.10.2 for details.*

- A/D Chrominance Gain Option, *refer to 3.2.10.3 for details.*

- Recall Encoder Setup Option, *refer to 3.2.11.1 for details.*

- Save Encoder Setup Option, *refer to 3.2.11.2 for details.*

- Select Reset Type Option, *refer to 3.2.11.5 for details.*

- Adjust Display Contrast Option, *refer to 3.2.11.6 for details.*

3.1.3. Front Panel Menu

The setup, control and monitoring of the E-1000 of encoders operation is locally provided using the extended E-1000 Front Panel Menu. This menu is displayed on the Front Panel LCD and is operated by the Front panel Control Pads.

All configurations share a common initialization phase and, when successfully completed, the Encoder System Menu is displayed, enabling access to the Front Panel Menu Tree of the encoder. The Encoder System Menu tree provides the following options (see Figure 3-2):

ENCODER CONFIGURATION MENU
This menu provides access for setting-up the encoder's parameters. Refer to paragraph 3.2.1 for a detailed description.

ENCODER STATUS MENU
This menu displays the current status of the encoder's parameters. Refer to paragraph 0 for a detailed description.

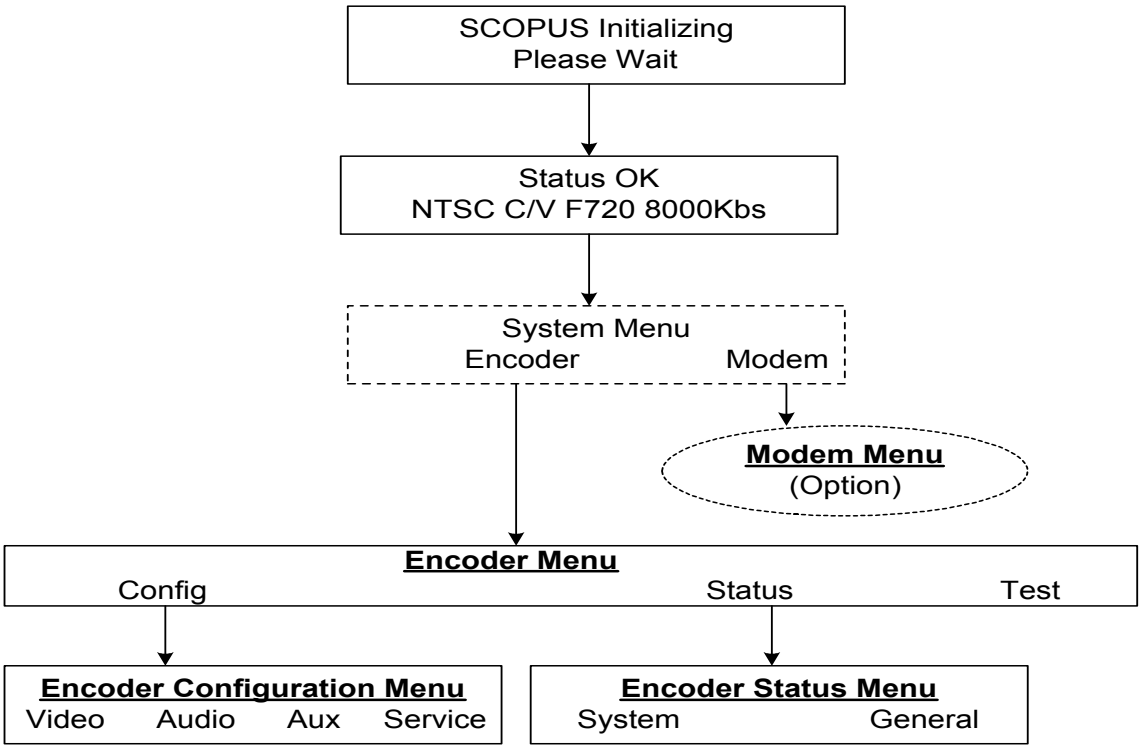
ENCODER TEST OPTION
This option activates a detailed functional test session for the encoder main functions. Refer to paragraph 3.4 for a detailed description.

NOTE

A dotted menu selection in the Menu Tree diagrams indicates that the availability of this option is dependent upon the system configuration.

The Modem Menu option is displayed only when the encoder is connected to an RF Modulator / Exciter.

Figure 3-2: Encoder Front Panel Menu - Basic Tree Structure



3.2. ENCODER CONFIGURATION MENU

3.2.1. Encoder Configuration Menu Overview

The **Encoder Configuration** Menu enables the E-1000 user to view and set the configuration parameters of the encoder. The menu is activated from the Encoder Main Menu, by selecting the "**Config**" option in the **Encoder Menu**.

3.2.1.1. Encoder Configuration Menu Structure

The Encoder Configuration parameters are grouped into four categories (see Figure 3-3):

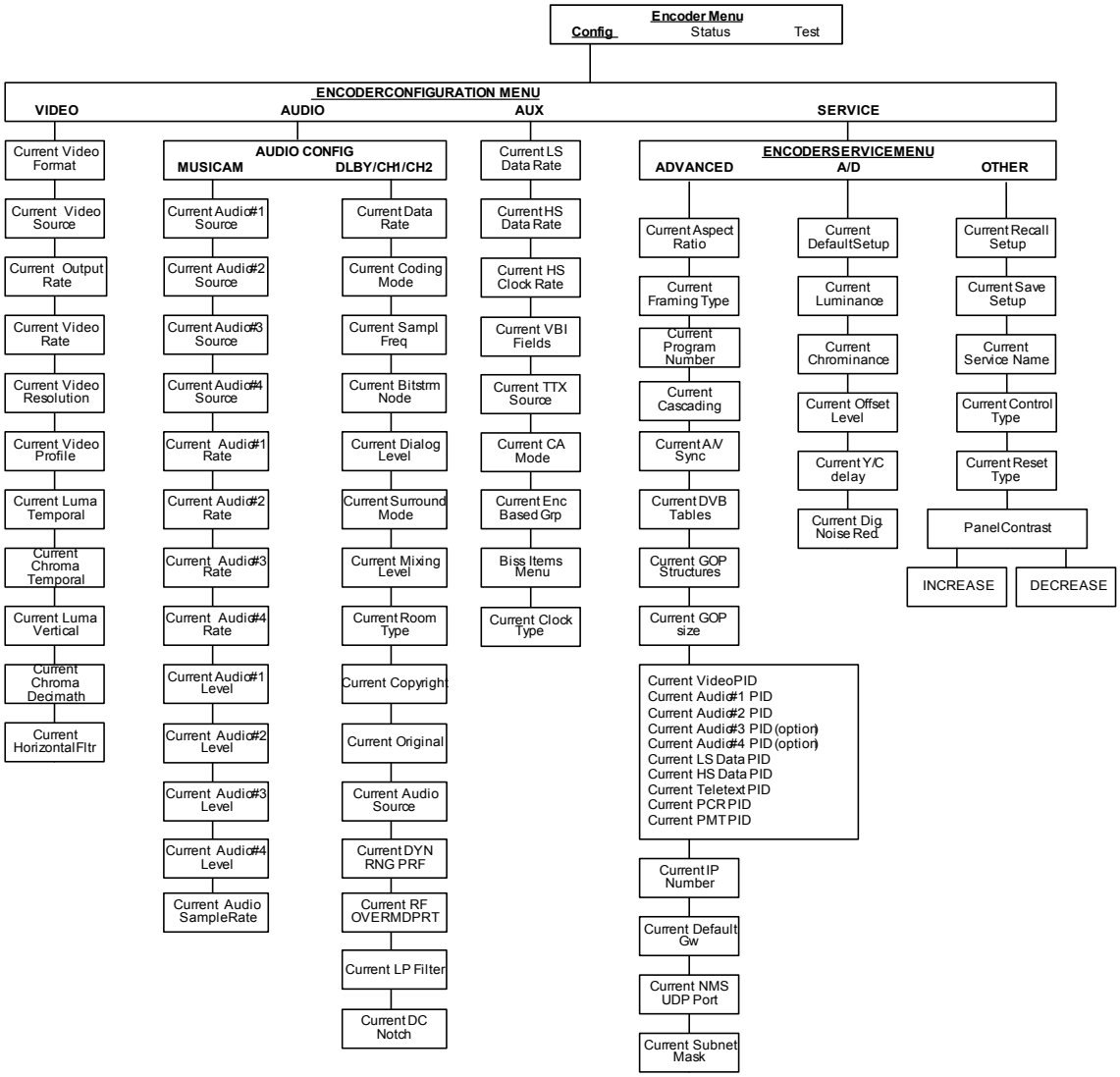
THE VIDEO PARAMETERS:
The **Video** category in the **Encoder Configuration Menu** provides access for setting up the encoder for the video data received (input) and generated (output). For details, see paragraph 3.2.2.

THE AUDIO PARAMETERS:
The **Audio** category in the **Encoder Configuration Menu** provides access for setting up the encoder for the audio data received (input) and generated (output) and for managing Dolby parameters. For details, see paragraph 3.2.3.

THE AUXILIARY PARAMETERS:
The **Aux** category in the **Encoder Configuration Menu** provides access for setting up a group of additional data processing functions, including Teletext and Conditional Access parameters. For details, see paragraph 3.2.6.

THE SERVICE PARAMETERS:
The **Service** sub-menu in the **Encoder Configuration Menu** provides access for setting up to a wide range of service parameters. For details, see paragraph 3.2.8.

Figure 3-3: Encoder Configuration Menu Tree

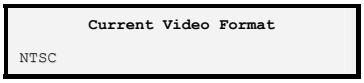


3.2.1.2. Encoder Configuration Menu Operation

The touch pad keys on the Encoder Front Panel control the operation of the **Encoder Configuration** Menu.

MENU NAVIGATION

Navigation in the menu consists of scrolling through the branch options, using the **[Up] / [Down]** touch pads. It displays the various parameters available to the operator.



Each parameter is displayed with the "**Current**" label preceding the "**Parameter**" label on the top line of the LCD and the currently active option on the bottom line.

PARAMETER CONFIGURATION

Pressing the **[Enter]** touch pad selects the parameter for configuration and changes the "**Current**" label to "**Select:**" label.

Two types of parameters are available for configuration (Options and Values). Each type requires a different set-up procedure:

Selecting an Option:

This type of parameters features a list of valid options. The user is enabled to select one of the options to replace the currently active option. The **[Up] / [Down]** touch pads enables the user to navigate through the list of valid options. An asterisk (*) identifies the currently active option.

Setting-Up a Number/Value:

This parameter is numerical, presented as a string of digits and representing a decimal or hexadecimal value. The **[Left] / [Right]** are used to select the digit to be changed. The **[Up] / [Down]** are used to increase / decrease the value of the digit.

SAVING CHANGES

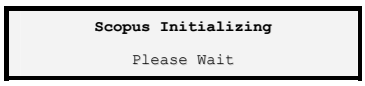
Saving a configuration change requires confirmation (unless otherwise specified), as detailed in paragraph 3.1.2 above.

3.2.2. Video Configuration Menu

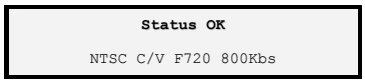
The **Video Configuration** Menu enables the user to access and set the parameters of the video information received and provided by the encoder.

The **Video Configuration** Menu is activated from the **Encoder Configuration** Menu by selecting the "**Video**" option:

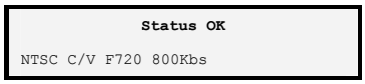
Power-Up the Encoder



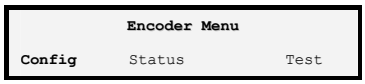
Wait for Power Up to complete



Wait for Initialization to complete



Press **[Down]** touch pad to activate and enter the **Encoder Menu**

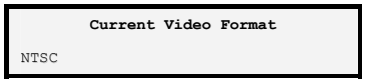


Select "**Config**" option in the **Encoder** Menu to activate and enter the **Encoder Configuration** Menu

Navigate by **[Left]** / **[Right]** and confirm selection by **[Enter]**.

Select "**Video**" option in the **Encoder Configuration** Menu to activate and enter the **Video Configuration** Menu Branch

Navigate by **[Left] / [Right]** and confirm selection by **[Enter]**.



NOTES

*Activating the "**Video**" option provides access to a group of video functions/items, enabled for monitoring and setting up.*

The following sub-paragraphs describe the parameters available for each of these functions (also refer also to Figure 3-3 for the structure of the Video Configuration Menu branch).

3.2.2.1. Video Format Configuration

The **Video Format** item in the **Encoder Configuration→Video Menu** displays the current video format

Display Current **Video Format**

Current Video Format
NTSC

Pressing the **[Enter]** keypad enables setting up the format of the video signal received. Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Configuring **Video Format** / Select Options

Select: Video Format
NTSC *
PAL

Valid Options:

- **PAL:** European Color TV Standard
- **NTSC**: USA Color TV Standard

3.2.2.2. Video Source Configuration

The **Video Source** item in the **Encoder Configuration→Video Menu** displays the current video source to the encoder.

Display Current **Video Source**

Current Video Source
SDI

Pressing the **[Enter]** keypad enables the selection of the type of video signal received.

Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter]**.

Configuring **Video Source** / Select Options

Select: Video Source
SDI *
C/V
S-VHS
YUV

Valid Options:

- **C/V:** Analog composite standard video signal
- **SDI**: Digital video signal
- **S-VHS**: Analog composite super-VHS video signal
- **YUV**: Analog Y-U-V component video signal

NOTE

The installed type of Video Input Panel determines the type of the video source options displayed for selection (refer to paragraph 1.4.4 for details).

3.2.2.3. Output Rate Configuration

The **Output Rate** item in the **Encoder Configuration→Video Menu** displays the encoder's current output rate value.

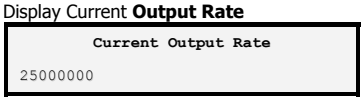
Pressing the **[Enter]** keypad enables setting up of the transport stream output rate.

Select the digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].** Confirm value by **[Enter]**.

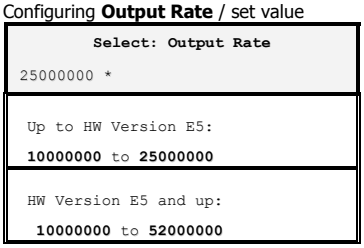
Valid Values:

- Up to hardware version HW E5:
  A decimal number from 1000000 to 25000000 (10-25 Mbps)
- Hardware versions HW E5 and up:
  A decimal number from 1000000 to 52000000 (10-52 Mbps)

Display Current **Output Rate**



Configuring **Output Rate** / set value



3.2.2.4. Video Rate Configuration

IMPORTANT

The Video Rate parameter is the maximum rate assigned to the video component in the stream and it depends on the output rate.

If the Output Rate is lower than the Video Rate, the value set for the Output Rate is displayed and the this maximum output rate is assigned to the video.

The **Video Rate** item in the **Encoder Configuration→Video Menu** displays the encoder's current video rate value

Pressing the **[Enter]** keypad enables setting up of the transport stream output rate value.

Select the digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**

Confirm value by **[Enter]**.

Valid Values:

- Up to hardware version HW E5:
  A decimal number from 1000000 to 25000000
- Hardware versions HW E5 and up:
  A decimal number from 1000000 to 52000000

Display Current **Video Rate**

```
Current Video Rate
22000000
```

Configuring **Video Rate** / set value

```
Select: Video Rate
25000000 *
```

```
Up to HW Version E5:
From 10000000 to 25000000
```

```
HW Version E5 and up:
From 10000000 to 52000000
```

3.2.2.5. Video Resolution Configuration

NOTE

Use of the full vertical / 368 horizontal (FUL VER / 368 Hor) resolution is not recommended. For a better picture, use full vertical / 352 horizontal (FUL VER / 352 Hor) resolution.

The **Video Resolution** item in the **Encoder Configuration→Video Menu** displays the current resolution of the video.

Pressing the **[Enter]** keypad enables the selection of the type and resolution of the video signal (full or half vertical and the selected horizontal resolution].

Display Current **Video Resolution**

Current Video Resolution
FULL VER / 720 Hor

Configuring **Video Resolution** / Select Options

Current Video Resolution
FULL VER / 720 Hor *
FUL VER / 704 Hor
FUL VER / 640 Hor
FUL VER / 544 Hor
FUL VER / 480 Hor
FUL VER / 368 Hor
FUL VER / 352 Hor
HLF VER / 352 Hor
AUTO RESOLUTION

3.2.2.6. Video Profile Configuration

The **Video Profile** item in the **Encoder Configuration→Video Menu** displays the current MPEG-2 profile used for the video compression.

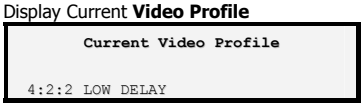
Pressing the **[Enter]** keypad enables the selection of the video compression profile and the video delay/latency.

Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter]**.

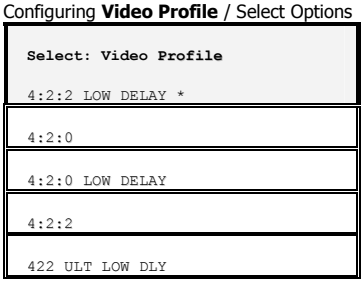
Valid Options:

- **4:2:0:**
  4:2:0 Main Profile @ Main Level compression
- **4:2:0 Low Delay:**
  4:2:0 compression profile with low latency/delay
- **4:2:2:**
  4:2:2 Professional Profile @ Main Level compression
- **4:2:2 Low Delay:**
  4:2:2 compression profile with low latency delay
- **422 ULT Low Dly:**
  4:2:2 compression profile with ultra low latency/delay

Display Current **Video Profile**



Configuring **Video Profile** / Select Options



3.2.2.7. Luminance Temporal Configuration

The **Luma Temporal** item in the **Encoder Configuration→Video Menu** displays the current state of the luminance vertical temporal filter for the picture vertical information.

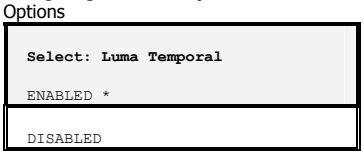
Pressing the **[Enter]** keypad enables toggling the filter operational state.

Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter]**.

Valid States: Enabled / Disabled

Display Current **Luma Temporal** (filter state)

Configuring **Luma Temporal** / Select Options



3.2.2.8. Chrominance Temporal Configuration

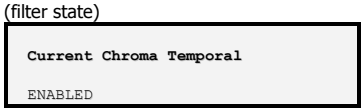
The **Chroma Temporal** item in the **Encoder Configuration→Video Menu** displays the current state of the chrominance vertical decimation filter for the picture vertical information.

Pressing the **[Enter]** keypad enables toggling the filter operational state.

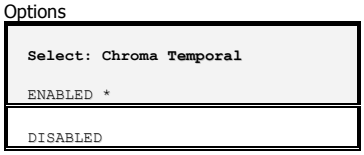
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter]**.

Valid States: Enabled / Disabled

Display Current **Chroma Temporal** (filter state)



Configuring **Chroma Temporal** / Select Options



3.2.2.9. Luminance Vertical Configuration

The **Luma Vertical** item in the **Encoder Configuration→Video Menu** displays the current level of the luminance vertical filter.

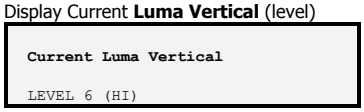
Pressing the **[Enter]** keypad enables setting up the filter operational level (8 levels).

Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter]**.

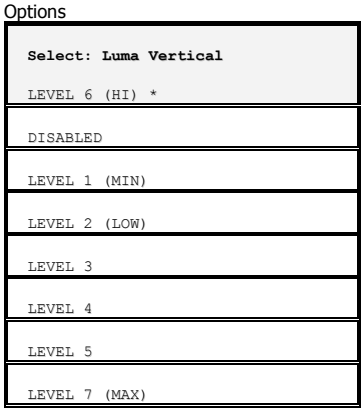
Valid Options:

- **DISABLED**
- **Level 1 (MIN), Level 2(LOW), Level 3, Level 4, Level 5, LEVEL 6 (HI), Level 7 (MAX)**

Display Current **Luma Vertical** (level)



Configuring **Luma Vertical** / Select Options



3.2.2.10. Chrominance Decimation Configuration

The **Chroma Decimath** item in the **Encoder Configuration→Video Menu** displays the current level of the chrominance decimation filter

Display Current **Chroma Decimath** (set level)

Current Chroma Decimath
LEVEL 1 (MIN)

Pressing the **[Enter]** keypad enables setting up the filter operational level (4 levels). This is an additional filtering on the Chrominance vertical decimation process (the decimation for obtaining the 4:2:0 picture).

Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter]**.

Valid Options:

- **DISABLED**
- **Level 1 (MIN) Level 2, Level 3 (MAX)**

Configuring **Chroma Decimath** / Select Options

Select: Luma Vertical
LEVEL 1 (MIN) *
DISABLED
LEVEL 2
LEVEL 3 (MAX)

3.2.2.11. Horizontal Filter Configuration

The **Horizontal Filter** item in the **Encoder Configuration→Video Menu** displays the current level of the horizontal filter and enables setting up the filter operational level (8 levels). This filter blurs the picture horizontally.

Display Current **Horizontal Filter**

Current Horizontal Filter
Level 7 (MAX)*

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **DISABLED**
- **Level 1 (MIN), Level 2 (LOW), Level 3, Level 4, Level 5, Level 6 (HI), Level 7 (MAX)**

Configuring **Horizontal Filter** / Select Options

Select: Horizontal Filter
Level 7 (MAX)*
DISABLED
Level 1 (MIN)
Level 2 (LOW)
Level 3
Level 4
Level 5
Level 6 (HI)

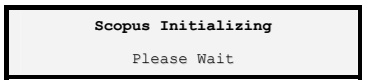
3.2.3. Audio Configuration Menu

The Audio Configuration menu enables the user to access and set the parameters of the audio information received by the encoder. The Audio menu has the following sub-menus:

- Audio MUSICAM Configuration menu manages audio related parameters such as: source, rate, level and sample rate. Refer to paragraph 3.2.4
- Audio Dolby Configuration menu manages Dolby related options. Refer to paragraph 3.2.5

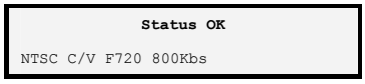
The **Audio Configuration** Menu is activated from the **Encoder Configuration** Menu by selecting the **"Audio"** option:

Power-Up the Encoder

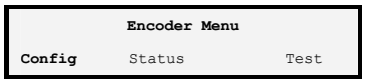


Wait for Power Up to complete

Wait for Initialization to complete



Press **[Down]** touch pad to activate and enter the **Encoder Menu**



Select "**Config**" option in the **Encoder** Menu to activate and enter the **Encoder Configuration** Menu

Navigate by **[Left]** / **[Right]** and confirm selection by **[Enter]**.

Select "**Audio**" option in the **Encoder Configuration** Menu to activate and enter the **Audio Configuration** Menu Branch

Navigate by **[Left] / [Right]** and confirm selection by **[Enter]**.

3.2.4. Audio MUSICAM Configuration Sub-Menu

The Audio MUSICAM Configuration Menu is a sub-set in the Audio Configuration menu (See paragraph 3.2.3). It enables the user to configure MUSICAM audio related parameters such as: source, rate, level and sample rate.

NOTE

Audio #3 and #4 are provided only when the optional Audio Expansion card is installed. Audio #3 and #4 parameters are configured in the same manner as the Audio #1 and Audio #4 parameters.

3.2.4.1. Audio #1, #2 Source Configuration

The **Audio #1, #2 Source** item in the **Config →Audio→MUSICAM** Menu Displays the current audio source and enables the selection of the type of the input audio source.

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **AUTO**: Audio type is automatically selected by the encoder
- **EMBEDDED**: Digital audio, embedded in the SDI signal
- **ANALOG**: Composite or Component analog audio signal
- **AES-EBU**: A/D converted audio data (stereo)
- **DOLBY**: Dolby Digital (AC-3) audio data (available on Channel 1 only)

Display Current **Audio #1, #2 Source**

Current Audio #1, #2 Source
AUTO

Configuring **Audio #1, #2 Source** / Select Options

Select: Audio #1, #2 Source
AUTO *
EMBEDDED
ANALOG
AES-EBU
DOLBY

3.2.4.2. Audio #1, #2 Rate Configuration

The **Audio #1, #2 Rate** item in the C**onfig→ Audio→MUSICAM** Menu Displays the current audio rate value and enables the selection of the encoding bit rate for the received audio signal.

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **64, 96, 128, 160 192, 224, 256, 320 or 384 Kbps**
- **OFF**

Display Current **Audio #1, #2 Rate**

Current Audio #1, #2 Rate
64 Kbps

Configuring **Audio #1, #2 Rate** / Select Options

Select: Audio #1, #2 Rate
64 Kbps *
96 Kbps
128 Kbps
160 Kbps
192 Kbps
224 Kbps
256 Kbps
320 Kbps
384 Kbps
OFF

3.2.4.3. Audio #1, #2 Level Configuration

IMPORTANT

This is an immediate action option. *Setting a new audio level for the channel is saved immediately, upon completion of configuration change.*

The **Audio #1, #2 Level** item in the **Config→ Audio→MUSICAM** Menu Displays the current audio level value and enables setting the audio level for the input audio signal.

Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Valid Options:

A decimal number between -12 dB and +12 dB

Display Current **Audio #1, #2 Level**

Current Audio #1, #2 Level
3

Configuring **Audio #1, #2 Level** / Set Value

Select: Audio #1, #2 Level
3*
A decimal number between -12 dB and +12 dB

3.2.4.4. Audio Sample Rate Configuration

The **Audio Sample Rate** item in the **Config→ Audio→MUSICAM** Menu Displays the current value and enables the selection of the A/D converter sampling rate for input audio signal.

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by ▲ **[Up]** / ▼ **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **32 KHz**
- **44.1 KHz**
- **48 KHz**

Display Current **Audio Sample Rate**

Current Audio SampleRate
32 KHz

Configuring **Audio Sample Rate** / Select Options

Select: Audio SampleRate
32 KHz*
44.1 KHz
48 KHz

3.2.5. Audio Dolby Configuration Sub-Menu

The Audio Dolby Configuration Menu is a sub-set in the Audio Configuration menu (See paragraph 3.2.3). It enables the user to configure Dolby Audio related parameters.

NOTE

Dolby #3 and #4 are provided only when the optional Dolby Expansion card is installed.

3.2.5.1. Dolby Data Rate Configuration

The **Data Rate** item in the **Config→ Audio→DLBY/CH3/CH4** Menu

Display Current **Data Rate**

Current DATA RATE
192K

Pressing the **[Enter]** keypad enables the selection of the item.

Navigate by ▲ **[Up]** / ▼ **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

640K, 576K, 512K, 448K, 384K, 320K, 256K, 224K, 192K, 160K, 128K, 112K, 96K, 80K, 64K, 56K

Configuring **Data Rate** / Select Options

Select: DATA RATE
192K
160K
128K
112K
96K
80K
64K
56K
640K
576K
512K
448K
384K
320K
256K
224K

3.2.5.2. Dolby Coding Mode Configuration

The **Coding Mode** item in the **Config→ Audio→DLBY/CH3/CH4** Menu sets the Dolby coding mode.

Display Current **Coding Mode**

Current CODING MODE
STEREO

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by ▲ **[Up]** / ▼ **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **STEREO**
- **MONO**
- **DISABLED**

Configuring **Coding Mode** / Select Options

Select: CODING MODE
STEREO
MONO
DISABLED

3.2.5.3. Dolby Sample Frequency Configuration

The **Sample Frequency** item in the **Config→ Audio→DLBY/CH3/CH4** Menu sets the sample frequency.

Display Current **Sampl Freq**

Current SAMPL. FREQ
48K

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **32 KHz**
- **44.1 KHz**
- **48 KHz**

Configuring **Sampl Freq** / Select Options

Select: SAMPL. FREQ
48K
32K
44.1K

3.2.5.4. Dolby Bit Stream Mode Configuration

The **Bit Stream Mode** item in the **Config→ Audio→DLBY/CH3/CH4** Menu sets the Dolby mode.

Display Current **Bit Stream Mode**

Current BITSTRM MODE
COMPLETE MAIN

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **VOICEOVER**
- **EMERGENCY**
- **COMMENTARY**
- **DIALOGUE**
- **HEARING IMPAIRED**
- **VISUALY IMPAIRED**
- **MUSIC n EFFECTS**

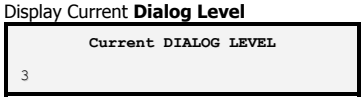
Configuring **Bit Stream Mode** / Select Options

Select: BITSTRM MODE
COMPLETE MAIN
VOICEOVER
EMERGENCY
COMMENTARY
DIALOGUE
HEARING IMPAIRED
VISUALY IMPAIRED
MUSIC n EFFECTS

3.2.5.5. Dolby Dialog Level Configuration

The **Dialog Level** item in the **Config→ Audio→DLBY/CH3/CH4** Menu sets the level of the dialog parameter.

Display Current **Dialog Level**



Pressing the **[Enter]** keypad enables setting up the item value.

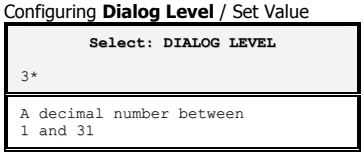
Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**

Confirm value by **[Enter]**.

Valid Options:

A decimal number between 1 and 31

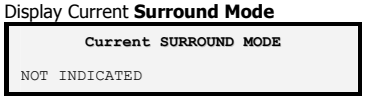
Configuring **Dialog Level** / Set Value



3.2.5.6. Dolby Surround Mode Configuration

The **Surround Mode** item in the **Config→ Audio→DLBY/CH3/CH4** Menu sets the surround stereo mode.

Display Current **Surround Mode**

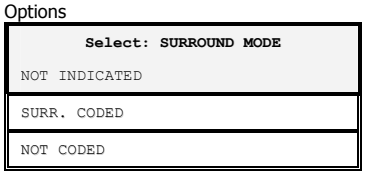


Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **NOT INDICATED**
- **SURR. CODED**
- **NOT CODED**

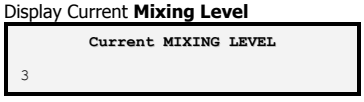
Configuring **Surround Mode** / Select Options



3.2.5.7. Dolby Mixing Level Configuration

The **Mixing Level** item in the **Config→ Audio→DLBY/CH3/CH4** Menu

Display Current **Mixing Level**



Pressing the **[Enter]** keypad enables setting up the item value.

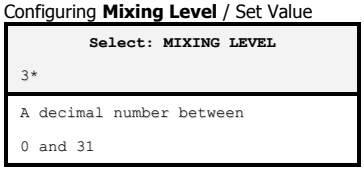
Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**

Confirm value by **[Enter]**.

Valid Options:

A decimal number between 0 and 31

Configuring **Mixing Level** / Set Value



3.2.5.8. Dolby Room Type Configuration

The **Room Type** item in the **Config→ Audio→DLBY/CH3/CH4** Menu sets the room size parameter.

Display Current **Room Type**

Current ROOM TYPE
SMALL ROOM

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **SMALL ROOM**
- **LARGE ROOM**
- **NOT INDICATED**

Configuring **Room Type** / Select Options

Select: ROOM TYPE
SMALL ROOM
LARGE ROOM
NOT INDICATED

3.2.5.9. Dolby Copy Right Configuration

The **Copy Right** item in the **Config→ Audio→DLBY/CH3/CH4** Menu

Display Current **Copy Right**

Current COPYRIGHT
1

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options: 1, 0

Configuring **Copy Right** / Select Options

Select: COPYRIGHT
1
0

3.2.5.10. Dolby Original Configuration

The **Original** item in the **Config→ Audio→DLBY/CH3/CH4** Menu

Display Current **Dolby Original**

Current ORIGIAL
1

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options: 1, 0

Configuring **Dolby Original** / Select Options

Select: ORIGINAL
1
0

3.2.5.11. Dolby Audio Source Configuration

The **Audio Source** item in the **Config→ Audio→DLBY/CH3/CH4** Menu sets the type of source for the audio data.

Display Current **Audio Source**

Current AUDIO SOURCE
AES-EBU

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **AES-EBU**
- **ANALOG**
- **EMBEDDED**
- **TEST TONE**

Configuring **Audio Source** / Select Options

Select: AUDIO SOURCE
AES-EBU
ANALOG
EMBEDDED
TEST TONE

3.2.5.12. Dolby DYN RNG PRF Configuration

The **DYN RNG PRF** item in the **Config→ Audio→DLBY/CH3/CH4** Menu sets the required audio dynamic range.

Display Current **DYN RNG PRF**

Current DYN RNG PRF
FILM STNDRD

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **NONE**
- **SPEECH**
- **MUSIC LIGHT**
- **MUSIC STNDRD**
- **FILM LIGHT**

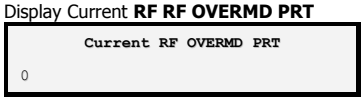
Configuring **DYN RNG PRF** / Select Options

Select: DYN RNG PRF
FILM STNDRD
NONE
SPEECH
MUSIC LIGHT
MUSIC STNDRD
FILM LIGHT

3.2.5.13. Dolby RF OVERMD PRT Configuration

The **RF OVERMD PRT** item in the **Config→ Audio→DLBY/CH3/CH4** Menu

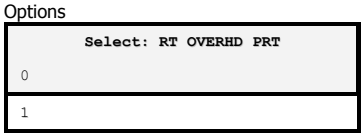
Display Current **RF RF OVERMD PRT**



Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by ▲ **[Up]** / ▼ **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options: 1, 0

Configuring **RF OVERMD PRT** / Select Options



3.2.5.14. Dolby LP Filter Configuration

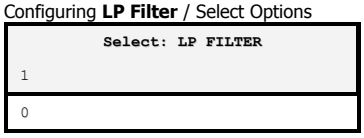
The **LP Filter** item in the **Config→ Audio→DLBY/CH3/CH4** Menu activates/deactivates the Low-Pass filter.

Display Current **LP Filter**

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by ▲ **[Up]** / ▼ **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options: 1, 0

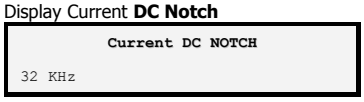
Configuring **LP Filter** / Select Options



3.2.5.15. Dolby DC Notch Configuration

The **DC Notch** item in the **Config→ Audio→DLBY/CH3/CH4** Menu activates/deactivates the DC Notch filter.

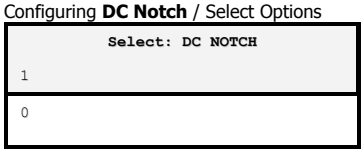
Display Current **DC Notch**



Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by ▲ **[Up]** / ▼ **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options: 1, 0

Configuring **DC Notch** / Select Options

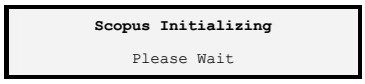


3.2.6. Auxiliary Configuration Menu

The Auxiliary Configuration menu enables the user to access and set the auxiliary parameters of the audio information received by the encoder. The paragraph below describes the parameters available for each of these functions (refer also to Figure 3-3 for the menu structure).

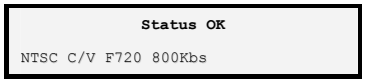
The **Auxiliary Configuration** Menu is activated from the **Encoder Configuration** Menu by selecting the **"AUX"** option:

Power-Up the Encoder



Wait for Power Up to complete

Wait for Initialization to complete

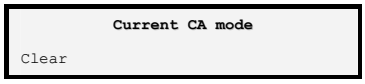


Press **[Down]** touch pad to activate and enter the **Encoder Menu**

Select "**Config**" option in the **Encoder** Menu to activate and enter the **Encoder Configuration** Menu

Navigate by **[Left]** / **[Right]** and confirm selection by **[Enter]**.

Select "**AUX**" option in the **Encoder Configuration** Menu to activate and enter the **Auxiliary Configuration** Menu Branch



3.2.6.1. Low Speed Data Rate Configuration

The **LS Data Rate** item in the **Config→ Auxiliary** Menu Sets the data rate of the low speed data received by the encoder.

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **NONE**
- **2400, 4800, 9600, 19200, 38400, 57600, 115200 Baud**

Display Current **LS Data Rate**

Current LS Data Rate
2400

Configuring **LS Data Rate** / Select Options

Select: LS Data Rate
2400 *
4800 Baud
9600 Baud
19200 Baud
38400 Baud
57600 Baud
115200 Baud
NONE

3.2.6.2. High Speed Data Rate Configuration

The **HS Data Rate** item in the **Config→ Auxiliary** Menu Sets the high speed data (HSD) rate.

Pressing the **[Enter]** keypad enables setting up the item value.
Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Valid Options:

Number up to: 20000000 (Dec)

Display Current **HS Data Rate**

Current HS Data Rate
25000000

Configuring **HS Data Rate** / Set Value

Select: HS Data Rate
25000000 *
Number up to: 20000000 (Dec)

3.2.6.3. High Speed Clock Rate Configuration

The **HS Clock Rate** item in the **Config→ Auxiliary** Menu Sets the HSD clock rate.

Display Current **HS Clock Rate**

Current HS Clock Rate
512 KHz

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

64, 512, 1024, 2048, 3072, 4096, 6144, 8192 KHz

Configuring **HS Clock Rate** / Select Options

Select: HS Clock Rate
512 KHz *
64 KHz
1024 KHz
2048 KHz
3072 KHz
4096 KHz
6144 KHz
8192 KHz

3.2.6.4. VBI Fields Configuration

The **VBI Fields** item in the **Config→ Auxiliary** Menu Displays the current enabled VBI features and enables the selection of the VBI features to be provided.

Display Current **VBI Fields**

Current VBI Fields
OFF

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **OFF:** No VBI features are enabled.
- **ALL**: All VBI features (SMC, WSS, TTX and VPS) are enabled:
  - **SMC**: Stereo Mode Control
  - **WSS**: Wide Screen Signaling
  - **TTX**: Teletex
  - **VPS**: Video Program Source
- **SMC+WSS+TTX**: Only SMC, WSS and TTX are enabled
- **SMC+WSS**: Only SMC and WSS are enabled
- **SMC+TTX+VPS**: Only SMC, TTX and VPS are enabled

Configuring **VBI Fields** / Select Options

Select: VBI Fields
OFF *
ALL
SMC+WSS+TTX
SMC+WSS
SMC+TTX+VPS
SMC+TTX
SMC
WSS+TTX+VPS
WSS+TTX
WSS
TTX+VPS
TTX
SMC + VPS
WSS + VPS
VPS

```
SMC + WSS + VPS
```

- **SMC+TTX**: Only SMC and TTX are enabled
- **SMC**: Only SMC is enabled
- **WSS+TTX+VPS**: Only WSS, TTX and VPS are enabled
- **WSS+TTX**: Only WSS and TTX are enabled
- **WSS**: Only WSS is enabled
- **TTX+VPS**: Only TTX and VPS are enabled
- **TTX**: Only TTX is enabled
- **SMC+VPS**: Only SMC and VPS are enabled
- **WSS+VPS**: Only WSS and VPS are enabled
- **VPS**: Only VPS is enabled
- **SMC+WSS+VPS**: Only SMC, WSS and VPS are enabled.

3.2.6.5. Teletext Source Configuration

The **TTX Source** item in the **Config→ Auxiliary** Menu Displays the current input source of teletex and enables the selection of the source.

Display Current **TTX Source**

```
        Current TTX Source
OVER-C/V
```

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by ▲ **[Up]** / ▼ **[Down]** to select an option and confirm selection by **[Enter].**

Configuring **TTX Source** / Select Options

```
        Select: TTX Source
OVER-C/V *
```

```
Follows - Video
```

Valid Options:

- **OVER-C/V:** Analog Teletex is received over the C/V input.
- **FLLOWS-VIDEO:** The digital teletex PID follows the Video PID.

3.2.6.6. Conditional Access Menu Configuration

The **CA Menu** item in the **Config→ Auxiliary** Menu Displays the current Conditional Access operation mode and enables the selection of the CA operation mode enabled on the encoder.

Display Current **CA Menu**

Current CA Menu
BISS modes

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Configuring **CA Menu** / Select Options

Select: CA Menu
BISS modes *
Clear
Encdr Basd Encr

Valid Options:

- **Clear:** No encryption (clear stream)
- **BISS modes:** Basic Interoperable Scrambling System (BISS) Mode Encryption
- **Encdr Basd Encr:** Encoder based encryption

3.2.6.7. Encoder Based Group Configuration

The **Enc Based Grp** item in the **Config→ Auxiliary** Menu sets the encryption group When the Encoder Based Encryption option is activated, (up to 16 options available, marked 00 to 15).

Display Current **Enc Based Grp**

Current Enc Based Grp
003

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Configuring **Enc Based Grp** / Set Value

Select: Enc Based Grp
003 *
00
.
.
15

Valid Options:

00 Grp # (up to 15 Grp): 16 Encoder based encryption groups.

NOTE

The encoder based encryption is available only for CODICO® IRD-25x0 Integrated Receiver Decoders.

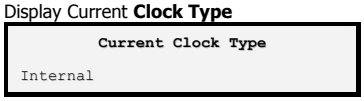
3.2.6.8. Clock Type Configuration

The **Clock Type** item in the **Config→ Auxiliary** Menu Displays the current clock source and enables the selection of the source for the channel clock.

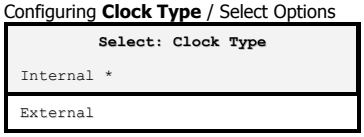
Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options: Internal, External

Display Current **Clock Type**



Configuring **Clock Type** / Select Options



NOTE:

*After selecting the Channel Clock type, the menu performs a jump to the Output Rate parameter, to select the rate of the output transport stream (in the **Config-> Video** menu, refer to paragraph 3.2.2).*

3.2.7. BISS Items Configuration Sub-Menu

The BISS Items Configuration Sub-Menu provides a group of configuration options for the various scrambling operating modes under the BISS Encryption standard. For a detailed description of the BISS scrambling and encryption functions, refer to paragraph 4.4.

NOTE:

*The sub-menu is activated from the **Encoder Auxiliary Configuration** Menu by pressing the **[Enter]** keypad on the E-1000 Front Panel when the **BISS Items Menu** item is displayed.*

The paragraphs below describe these parameters (refer also to Figure 3-3 for the sub-menu structure).

MENU OPERATION

- Navigating (**UP**/**DOWN** touch pads) in the menu displays the various parameters available. Each parameter is displayed with the "**Current**" label preceding the "**Parameter**" label on the top line of the LCD and the current active option on the bottom line.
- Selecting the parameter for configuration changes the "**Current**" label to "**Selelct:**" label and enables the user to navigate through the valid options available for each parameter. The current active option is marked by an asterisk (*).
- Saving a configuration change requires confirmation (unless otherwise specified), as detailed in paragraph 3.1.2 above.

The BISS Items Configuration Sub-Menu supports the following scrambling modes:

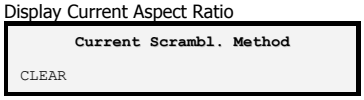
- **Clear** Mode (No scrambling), provided in the **Config→Aux→BISS Items Mode** sub-menu (for details, refer to paragraph).
- **Mode 1** Mode (BISS Mode-1 scrambling), provided in the **Config→Aux→BISS Items Mode** sub-menu (for details, refer to paragraph).
- **Burr ID** Mode (BISS-E Buried ID scrambling), provided in the **Config→Aux→BISS Items Mode** sub-menu (for details, refer to paragraph).
- **Inj ID** (BISS-E Injected ID scrambling), provided in the **Config→Aux→BISS Items Mode** sub-menu (for details, refer to paragraph).

Navigate in the **Encoder Configuration** Menu by **[Up]** / **[Down]** to select the **BISS Items Menu** and confirm selection by **[Enter].**

Display Current **BISS Items Menu**

The **Scrambling Method** item in the **Config→Aux→BISS Items** Menu displays the current active scrambling mode and enables setting-up the scrambling mode parameters.

Display Current Aspect Ratio

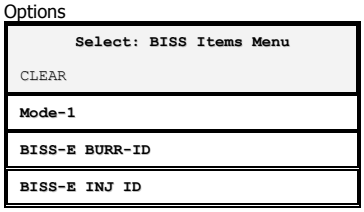


Pressing the **[Enter]** keypad enables the selection of the item.

Valid Options:

- **(Current) CLEAR:** No scrambling
- **(Current) MODE 1:** BISS-1 Mode
- **(Current) Biss-E Bur-ID:** BISS-E Mode with buried ID as active ID
- **(Current) Biss -E Inj-ID:** BISS-E Mode with injected ID

Configuring **BISS Items Menu** / Select Options

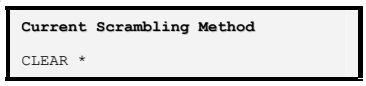


3.2.7.1. Clear / No Scrambling Configuration

Setting up the encoder for transport stream for Clear / No Scrambling requires the user to activate the Clear scrambling method.

Press **[Right]** touch pad to activate and enter the **Scrambling Method** Select option.

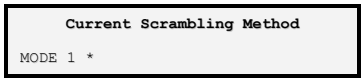
Navigate by **[Up]** / **[Down]** touch pads to display the **CLEAR** select item and press **[Enter]** key to activate this scrambling mode.



3.2.7.2. BISS Mode-1 Scrambling Configuration

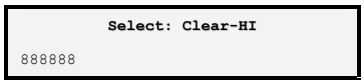
Setting up the encoder for transport stream scrambling under BISS Mode-1 Scrambling mode requires the user to activate the BISS Mode-1 scrambling method and enter the Open Session Word (12 Hex characters / 48 bits word).

Press **[Right]** touch pad to activate and enter the **Scrambling Method** Select option.



Navigate by **[Up]** / **[Down]** touch pads to display the **Mode 1** select item and press **[Enter]** key to activate this scrambling mode.

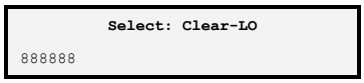
Navigate by **[Up]** / **[Down]** touch pads in the **BISS Items** Sub-Menu to display the **Clear-HI** current value.



Press **[Right]** touch pad to activate and enter the **Clear-HI** option, the first 6, most significant, characters in the BISS Mode-1 Open Session Word.

Use the **[Left]** / **[Right]** touch pads to select the character to be changed and the **[Up]** / **[Down]** touch pads to increase / decrease the value of the character. Press **[Enter]** key to accept the new value for the MS part of the BISS Mode-1 Clear Session Word.

Repeat above to select and set-up the **Clear-LO** option. This option sets-up the remaining 6 characters in the BISS Mode-1 Clear Session Word.



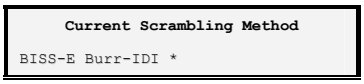
3.2.7.3. BISS-E Buried ID Scrambling Configuration

Setting up the encoder for transport stream scrambling under BISS-E Buried ID Scrambling mode requires the user to enter the Encrypted Session Word (16 Hex characters / 64 bits word).

This word is calculated from the Open Session Word and the unique Encoder Buried Identification word (for details, refer to paragraph 4.4).

Press **[Right]** touch pad to activate and enter the **Scrambling Method** Select option.

Navigate by **[Up]** / **[Down]** touch pads to display the **BISS-E Bur-ID** select item and press **[Enter]** key to activate this scrambling mode.



Navigate by **[Up]** / **[Down]** touch pads in the **BISS Items** Sub-Menu to display the **Crypto Key-HI** current value.

Press **[Right]** touch pad to activate and enter the **Crypto Key-HI** option, the first 8, most significant, characters in the BISS-E Encrypted Session Word (16 Hex characters / 64 bits word).

Use the **[Left]** / **[Right]** touch pads to select the character to be changed and the **[Up]** / **[Down]** touch pads to increase / decrease the value of the character. Press **[Enter]** key to accept the new value for the MS part of the BISS-E Encrypted Session Word.

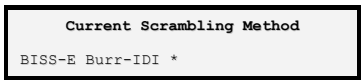
Repeat above to select and set-up the **Crypto Key-LO** option. This option sets-up the remaining 8 characters in the BISS-E Encrypted Session Word.

3.2.7.4. BISS-E Injected ID Scrambling Configuration

Setting up the encoder for transport stream scrambling under BISS-E Injected Key Scrambling mode requires the user to enter the Injected ID Word (14 Hex characters / 56 bits word) and the Encrypted Session Word (16 Hex characters / 64 bits word).

The Injected ID word is user defined while the Encrypted Session word is calculated from the Open Session Word and the unique Encoder Injected word (for details, refer to paragraph 4.4).

Press **[Right]** touch pad to activate and enter the **Scrambling Method** Select option.



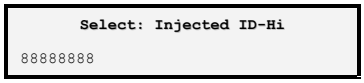
Navigate by **[Up] / [Down]** touch pads to display the **BISS-E Inj-ID** select item and press **[Enter]** key to activate this scrambling mode.

Navigate by **[Up] / [Down]** touch pads in the **BISS Items** Sub-Menu to display the **Crypto Key-HI** current value.

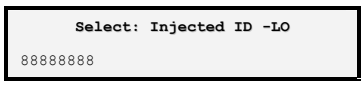
Press **[Right]** touch pad to activate and enter the **Crypto Key-HI** option, the first 8, most significant, characters in the BISS-E Encrypted Session Word (16 Hex characters / 64 bits word).

Use the **[Left] / [Right]** touch pads to select the character to be changed and the **[Up] / [Down]** touch pads to increase / decrease the value of the character. Press **[Enter]** key to accept the new value for the MS part of the BISS-E Encrypted Session Word.

Repeat above to select and set-up the **Crypto Key-LO** option. This option sets-up the remaining 8 characters in the BISS-E Encrypted Session Word.



Repeat above to select and set-up the **Injected ID HI** option. This option sets-up the first 6 characters in the BISS-E Injected ID Word (14 Hex characters / 56 Bits).



Repeat above to select and set-up the **Injected ID-LO** option. This option sets-up the remaining 8 characters in the BISS-E Encrypted Session Word.

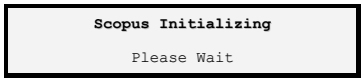
3.2.8. Service Configuration Menu

The Encoder Service Configuration Menu provides a group of monitoring and set-up functions for the Encoder. These parameters are grouped into three categories (Figure 3-3 above):

- Advanced service parameters, provided in the **Config→Service→ Advanced** sub-menu (for details, refer to paragraph 3.2.9).
- A/D service parameters, provided in the **Config→Service→A/D** sub-menu (for details, refer to paragraph 3.2.9.18).
- Additional service parameters provided in the **Config→Service→Other** sub-menu (for details, refer to paragraph 3.2.11).

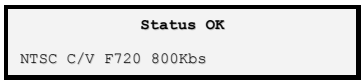
The **Service Configuration** Menu is activated from the **Encoder Configuration** Menu by selecting the **"Service"** option:

Power-Up the Encoder



Wait for Power Up to complete

Wait for Initialization to complete



Press ▼ **[Down]** touch pad to activate and enter the **Encoder Menu**

Select "**Config**" option in the **Encoder** Menu to activate and enter the **Encoder Configuration** Menu

Navigate by ◀ **[Left]** / ▶ **[Right]** and confirm selection by **[Enter]**.

Select "Service" option in the **Encoder Configuration** Menu to activate and enter the **Service Configuration** Menu Branch

3.2.9. Advanced Services Configuration Sub-Menu

The Advanced Services Configuration Sub-Menu provides access for set-up and configuration to advanced encoder service parameters. The paragraphs below describe these parameters (refer also to Figure 3-3 for the sub-menu structure).

MENU OPERATION

- Navigating (**Up** / **Down** touch pads) in the menu displays the various parameters available. Each parameter is displayed with the "**Current**" label preceding the "**Parameter**" label on the top line of the LCD and the current active option on the bottom line.
- Selecting the parameter for configuration changes the "**Current**" label to "**Selelct:**" label and enables the user to navigate through the valid options available for each parameter. The current active option is marked by an asterisk (*).
- Saving a configuration change requires confirmation (unless otherwise specified), as detailed in paragraph 3.1.2 above.

3.2.9.1. Aspect Ratio Configuration

The **Aspect Ratio** item in the **Config→Service→Advanced** Menu Displays the current value and enables the selection of the aspect ratio mode of display.

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **4:3**: Fixed aspect ratio, set to 4:3
- **16:9**: Fixed aspect ratio, set to 16:9
- **4:3 Auto**: Starts with aspect ratio of 4:3 and changes when the aspect ratio data is modified (WSS information in line 23).
- **16:9 Auto**: Starts with aspect ratio of 16:9 and changes when the aspect ratio data is changed (WSS information in line 23).

Display Current **Aspect Ratio**

Current Aspect Ratio
4:3

Configuring **Aspect Ratio** / Select Options

Select: Aspect Ratio
4:3 *
16:9
4:3 Auto
16:9 Auto

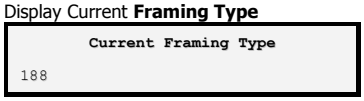
3.2.9.2. Framing Type Configuration

The **Framing Type** item in the **Config→Service→Advanced** Menu Displays the current value and enables the selection of the framing type.

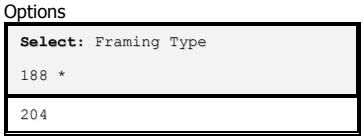
Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options: 188, 204

Display Current **Framing Type**



Configuring **Framing Type** / Select Options



3.2.9.3. Program Number Configuration

The **Program Number** item in the **Config→Service→Advanced** Menu is combining two streams from two encoders into one stream by connecting the first encoder output to the second encoder input.

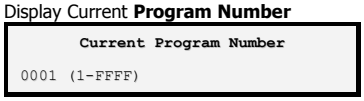
When cascading, each encoder in the chain should have the previous encoder program number.

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

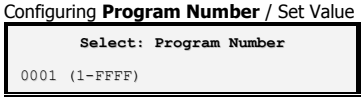
Valid Options:

4 digits, in Hex, which defines the program number of the incoming stream.

Display Current **Program Number**



Configuring **Program Number** / Set Value



3.2.9.4. Cascading Configuration

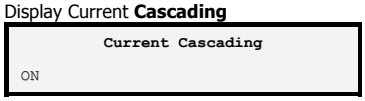
The **Cascading** item in the **Config→Service→Advanced** Menu Enables (**ON**) or disables (**OFF**) the cascading function.

When cascading, each encoder in the chain should have the previous encoder program number.

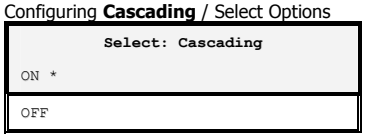
Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options: ON, OFF

Display Current **Cascading**



Configuring **Cascading** / Select Options



3.2.9.5. Audio to Video Sync Configuration

The **Audio to Video Sync** item in the **Config→Service→Advanced** Menu Displays the current value and enables the selection of the "lips" (audio to video) synchronization delay.

This value changes the audio offset in the stream:

- A positive value forwards (advances) the audio position in regards to the video/picture position.
- A negative value delays (withdraws) the audio position in regards to the video/picture position.

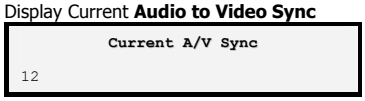
Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

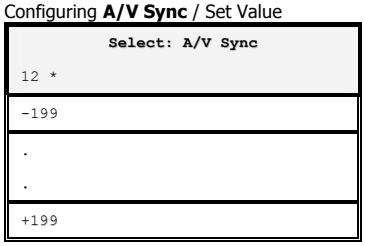
Valid Options:

± 199 mSec

Display Current **Audio to Video Sync**



Configuring **A/V Sync** / Set Value



3.2.9.6. DVB Tables Configuration

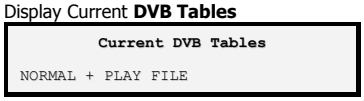
The **DVB Tables** item in the **Config→Service→Advanced** Menu Enables inclusion of DVB tables in the stream.

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

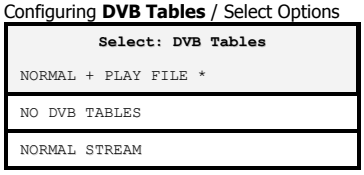
Valid Options:

- **NO DVB TABLES:** No DVB SI tables. Used for saving bandwidth.
- **NORMAL STREAM:** Includes DVB SI tables in stream.
- **NORMAL + PLAY TABLES FILE:** Includes DVB SI tables and "Play" tables in stream. "Play" tables are pre-prepared tables (set by Scopus), loaded from the Compact Flash card

Display Current **DVB Tables**



Configuring **DVB Tables** / Select Options



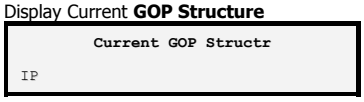
3.2.9.7. GOP Structure Configuration

The **GOP Structure** item in the **Config→Service→Advanced** Menu Displays the current value and enables the selection of the Group Of Pictures (GOP) stream structure.

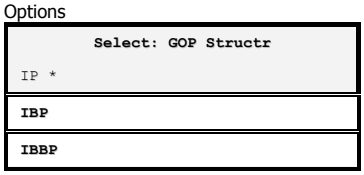
Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options: IP, IBP, IBBP

Display Current **GOP Structure**



Configuring **GOP Structure** / Select Options



3.2.9.8. GOP Size Configuration

The **GOP Size** item in the **Config→Service→Advanced** Menu Displays the current value and enables the selection of the size of the GOP.

Display Current **GOP Size**

```
Current GOP Size
000 (M:NN HeexaDec)
```

Pressing the **[Enter]** keypad enables the selection of the item.
Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **GOP Size** / Set Value

```
Select: GOP Size
000 (M:NN HexaDec)
```

Valid Options:

204 (M:NN Decimal)

Where:

- **M:** type of GOP; 1=IP, 2=IBP, 3=IBBP
- **NN:** GOP length; 01 to 99

NOTE

NN divided by M must result in integer (i.e., for NN=22 and M=3, the GOP size is not valid)

3.2.9.9. Video PID Configuration

The **Video PID** item in the **Config→Service→Advanced** Menu displays and manages the current Video PID

Display Current **Video PID**

```
Current Video PID
1061 (20-1FFF)
```

Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **Video PID** / Set Value

```
Select: Video PID
1061 (20-1FFF)
```

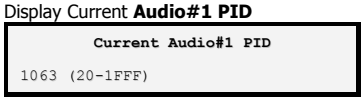
Valid Options:

Number between 20 and 1FFF

3.2.9.10. Audio#1 PID Configuration

The **Audio#1 PID** item in the **Config→Service→Advanced** Menu displays and manages the current Audio#1 PID value.

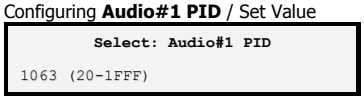
Display Current **Audio#1 PID**



Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **Audio#1 PID** / Set Value



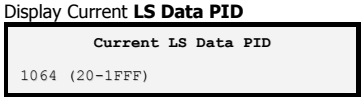
Valid Options:

Number between 20 and 1FFF

3.2.9.11. Low Speed Data PID Configuration

The **LS Data PID** item in the **Config→Service→Advanced** Menu displays and manages the current Low Speed Data PID.

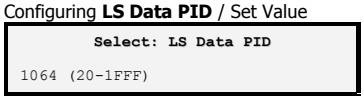
Display Current **LS Data PID**



Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **LS Data PID** / Set Value



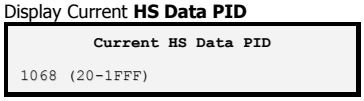
Valid Options:

Number between 20 and 1FFF

3.2.9.12. High Speed Data PID Configuration

The **HS Data PID** item in the **Config→Service→Advanced** Menu displays and manages the current High Speed Data PID value.

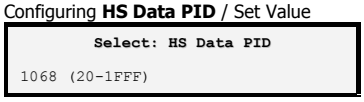
Display Current **HS Data PID**



Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **HS Data PID** / Set Value



Valid Options:

Number between 20 and 1FFF

3.2.9.13. Teletext PID Configuration

The **Teletext PID** item in the **Config→Service→Advanced** Menu displays and manages the current Teletext PID value.

Display Current **Teletext PID**

```
Current Teletext PID
1069 (20-1FFF)
```

Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **Teletext PID** / Set Value

```
Select: Teletext PID
1069 (20-1FFF)
```

Valid Options:

Number between 20 and 1FFF

3.2.9.14. PCR PID Configuration

The **PCR PID** item in the **Config→Service→Advanced** Menu displays and manages the current PCR PID value.

Display Current **PCR PID**

```
Current PCR PID
1080 (0=VidPID)
```

Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **PCR PID** / Set Value

```
Select: PCR PID
1080 (0=VidPID)
```

Valid Options:

Number between 20 and 1FFF or 0 for Video PID

3.2.9.15. PMT PID Configuration

The **PMT PID** item in the **Config→Service→Advanced** Menu displays and manages the current PMT PID value

Display Current **PMT PID**

```
Current PMT PID
1079 (20-1FFF)
```

Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **PMT PID** / Set Value

```
Select: PMT PID
1079 (20-1FFF)
```

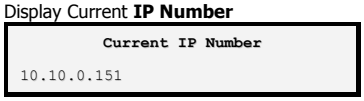
Valid Options:

Number between 20 and 1FFF

3.2.9.16. IP Number Configuration

The **IP Number** item in the **Config→Service→Advanced** Menu displays and manages the current IP Address value

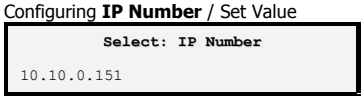
Display Current **IP Number**



Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **IP Number** / Set Value



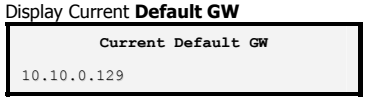
Valid Options:

Any valid IP Address.

3.2.9.17. Default Gateway Configuration

The **Default GW** item in the **Config→Service→Advanced** Menu displays and manages the current default gateway IP Address value

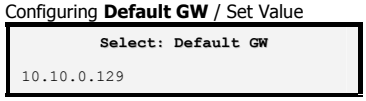
Display Current **Default GW**



Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **Default GW** / Set Value



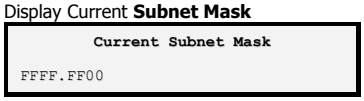
Valid Options:

Any valid IP Address.

3.2.9.18. Subnet Mask Configuration

The **Subnet Mask** item in the **Config→Service→Advanced** Menu displays and manages the current Subnet Mask value

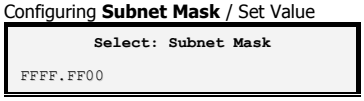
Display Current **Subnet Mask**



Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **Subnet Mask** / Set Value



Valid Options:

0000.0000 - FFFF.FFFF

3.2.10. A/D Services Configuration Sub-Menu

The A/D Services Configuration Sub-Menu provides access for set-up and configuration to advanced encoder service parameters. The paragraphs below describe these parameters (refer also to Figure 3-3 for the sub-menu structure).

Menu Operation

- Navigating (**UP** / **DOWN** touch pads) in the menu displays the various parameters available. Each parameter is displayed with the "**Current**" label preceding the "**Parameter**" label on the top line of the LCD and the current active option on the bottom line.
- Selecting the parameter for configuration changes the "Current" label to "Selelct:" label and enables the user to navigate through the valid options available for each parameter. The current active option is marked by an asterisk (*).
- Saving a configuration change requires confirmation (unless otherwise specified), as detailed in paragraph 3.1.2 above.

3.2.10.1. Restore Default Setup

IMPORTANT

This is an immediate action option. *The A/D reverts to the default values upon completion of configuration change.*

The **Restore Default Setup** item in the **Config→Service** Menu→**A/D** Sub-Menu Restores the device to the factory default setup. Pressing the **[Enter]** keypad enables the selection of the item.

Display Current **Restore Default Setup**

```
Current Default Setup
No-Operation
```

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Configuring **Restore Default Setup** / Select Options

```
Select: DVB Tables
No - Operation *
RESET IT NOW
```

Valid Options:

- **No-Operation -** do nothing
- **RESET IT NOW -** resets the encoder to the default setup

3.2.10.2. Luminance Configuration

IMPORTANT

This is an immediate action option. *Setting new luminance level is saved immediately, upon completion of configuration change*

Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Valid Options:

0 to 255 (default 128)

Configuring **Luminance** / Set Value

Select: Luminance
128*
00
.
.
255

3.2.10.3. Chrominance Configuration

IMPORTANT

This is an immediate action option. *Setting new luminance level is saved immediately, upon completion of configuration change*

The **Chrominance** item in the **Config→Service** Menu→**A/D** Sub-Menu Displays the current value and enables the selection of the chrominance gain.

Display Current **Chrominance**

Current Chrominance
128 (0-255)

Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Valid Options:

0 to 255 (default 128)

Configuring **Chrominance** / Set Value

Select: Chrominance
128 (0-255)

3.2.10.4. Offset Level Configuration

The **Offset Level** item in the **Config→Service** Menu→**A/D** Sub-Menu Displays the current value and enables the selection of the video offset level.

Display Current **Offset Level**

```
Current Offset Level
128 (0-255)
```

Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **Offset Level** / Set Value

```
Select: Offset Level
128 (0-255)
```

Valid Options:

0 to 255 (default 128)

3.2.10.5. Y-C Delay Configuration

The **Y-C Delay** item in the **Config→Service** Menu→**A/D** Sub-Menu Displays the current value and enables the selection of the Y to C delay for the component video (active only when component input interface is provided).

Display Current **Y-C Delay**

```
Current Y-C Delay
06 (0-12)
```

Pressing the **[Enter]** keypad enables setting up the item value.

Select a digit by **[Left] / [Right]** and set the digit value by **[Up]** / **[Down].**
Confirm value by **[Enter]**.

Configuring **Y-C Delay** / Set Value

```
Select: Y-C Delay
06 (0-12)
```

Valid Options:

0 to 12 (default 6)

3.2.10.6. Dig. Noise Red. Configuration

The **Dig. Noise Red.** item in the **Config→Service** Menu→**A/D** Sub-Menu Displays the current value and enables the selection of the digital noise reduction (DNR) filters activated (active in E-1000 Encoder with DNR function activated).

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **OFF** (default)
- **LOW**
- **MEDIUM**
- **HIGH**

Display Current **Dig. Noise Red.**

Current Dig. Noise Red
OFF *

Configuring **Dig. Noise Red.**/ Select Options

Select: Dig. Noise Red
OFF *
HIGH
MEDIUM
LOW

3.2.11. Other Service Configuratrion Sub-Menu

The Other Service Configuration Sub-Menu provides access for set-up and configuration of additional encoder service parameters. The paragraphs below describe these parameters (refer also to Figure 3-3 for the sub-menu structure).

MENU OPERATION

- Navigating (**UP** / **DOWN** touch pads) in the menu displays the various parameters available. Each parameter is displayed with the "**Current**" label preceding the "**Parameter**" label on the top line of the LCD and the current active option on the bottom line.
- Selecting the parameter for configuration changes the "**Current**" label to "**Select:**" label and enables the user to navigate through the valid options available for each parameter. The current active option is marked by an asterisk (*).
- Saving a configuration change requires confirmation (unless otherwise specified), as detailed in paragraph 3.1.2 above.

3.2.11.1. Recall Setup

IMPORTANT

This is an immediate action option. *After recalling the setup, the encoder reboots it self immediately.*

The **Recall Setup** item in the **Config→Service** Menu→ **Other** Sub-Menu Loads a user-defined set-up that was previously saved using the 'Save Encoder Setup'.

Use the up and down touch pads to scroll between the saved setups. There are 10 saved setups numbered between zero and nine.

Press the Enter touch pad to load the setup or Esc to cancel the operation.

Display Current **Recall Setup**

```
Current Recall Setup
0
```

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by ▲ **[Up]** / ▼ **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

Numbers between 0 and 9

Configuring **Recall Setup** / Set Value

```
Select: Recall Setup
Number between 0 and 9
```

3.2.11.2. Save Setup

IMPORTANT

This is an immediate action option. *The new values are saved immediately, upon completion of configuration change.*

Saving *the parameters does not require the encoder to reboot.*

The **Save Setup** item in the **Config→Service** Menu→ **Other** Sub-Menu Internally saves the Encoder parameters.

There can be 10 different saves of the parameters numbered between zero and nine.

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

Numbers between 0 and 9

Display Current **Save Setup**

```
Current Save Setup 0

0
```

Configuring **Save Setup** / Set Value

```
Select: Save Setup

Number between 0 and 9
```

3.2.11.3. Service Name Configuration

The **Service Name** item in the **Config→Service** Menu→ **Other** Sub-Menu Defines a name for the service.

Pressing the **[Enter]** keypad enables setting up the item value.

Select a character by **[Left]** / **[Right]** and set the character value by **[Up]** / **[Down].**

Confirm value by **[Enter]**.

Valid Options:

Up to 22 Characters. String must end with a '$' character.

Display Current **Service Name**

```
Current Service Name

ENC2
```

Configuring **Service Name** / Set Value

```
Select: Service Name

ENC2
```

3.2.11.4. Control Type Configuration

The **Control Type** item in the **Config→Service** Menu→ **Other** Sub-Menu Defines a name for the service.

Valid value:

Up to 22 Characters

Display Current **Control Type**

Current Video Format
NTSC

Configuring **Control Type** / Set Value

Select: Video Format
NTSC *

3.2.11.5. Reset Type Configuration

IMPORTANT

This is an immediate action option. *Selecting a reset type is saved immediately, upon completion of configuration change.*

The **Reset Type** item in the **Config→Service** Menu→ **Other** Sub-Menu Displays the current value and enables the selection of the type of reset for the encoder.

Pressing the **[Enter]** keypad enables the selection of the item.
Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter].**

Valid Options:

- **BOOT: Fast (S/W) boot**
- **RELOAD PARAMETERS: Reloads encoder parameters during the boot.**

Display Current **Reset Type**

Current Reset Type
No-Opwration

Configuring **Reset Type** / Select Options

Select: Reset Type
No-Operation
Boot
Reload Encoder

3.2.11.6. Panel Contrast Configuration

IMPORTANT

This is an immediate action option. *Increasing the contrast is linear. Decreasing the contrast requires selecting the DECREASE option each time.*

The **Panel Contrast** item in the **Config→Service** Menu→ **Other** Sub-Menu Displays the current value and enables the selection of the type of reset for the encoder.

- **INCREASE:** Each press on the Enter touch pad increases the LED contrast by one step.
- **DECREASE:** Each press on the Enter touch pad decreases the LED contrast by one step.

Display Current **Panel Contrast**

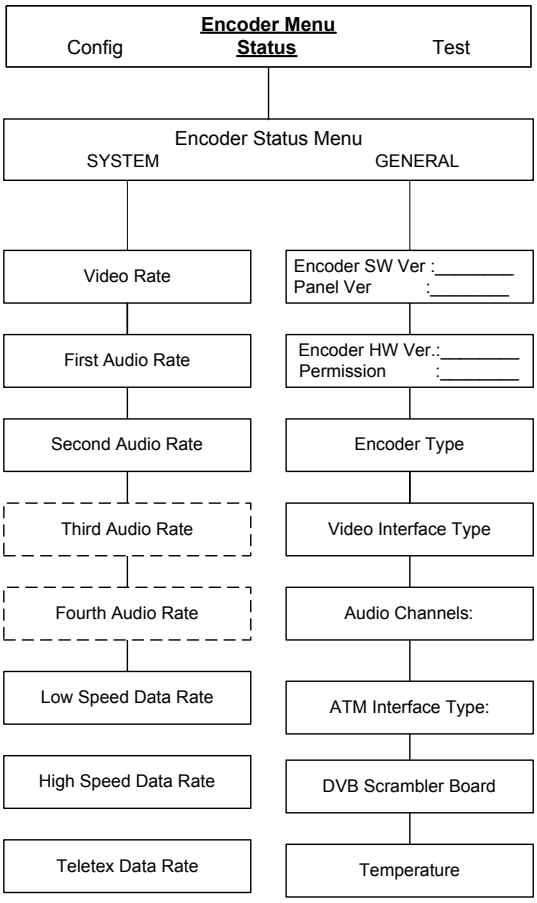
```
Current Panel Contrast
INCREASE              DECREASE
```

3.3. STATUS MENU

The Encoder Status menu enables the user to monitor the current status of the encoder parameters.

Figure 3-4 shows the Encoder Status Menu flowchart. The following sub-paragraphs describe the parameters available for each function.

Figure 3-4:Encoder Status Menus



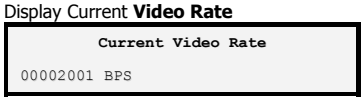
3.3.1. System Status Menu

The **Status→System** Menu provides access for monitoring system parameters. The paragraphs below describe these parameters (refer also to Figure 3-4 for the sub-menu structure).

3.3.1.1. Video Rate Display

The **Video Rate** item in the **Encoder Status→ System** displays the current video rate

Display Current **Video Rate**

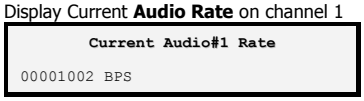


Navigate by **[Up]** / **[Down]** to display the items in the system status Menu.

3.3.1.2. Audio Rate Display

The **Audio Rate** item in the **Encoder Status→ System** displays the current audio rate on each channel. Channels 3 and 4 are displayed when the Audio expansion card is installed.

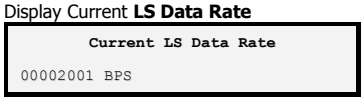
Display Current **Audio Rate** on channel 1



3.3.1.3. LS Data Rate Display

The **LS Data Rate** item in the **Encoder Status →System** displays the current Low Speed Data rate

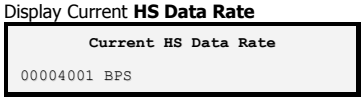
Display Current **LS Data Rate**



3.3.1.4. HS Data Rate Display

The **HS Data Rate** item in the **Encoder Status→System** displays the current High Speed Data rate

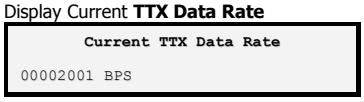
Display Current **HS Data Rate**



3.3.1.5. TTX Data Rate Display

The **TTX Data Rate** item in the **Encoder Status→System** displays the current Teletext Data rate

Display Current **TTX Data Rate**



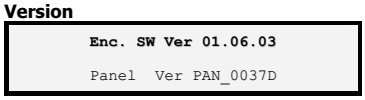
3.3.2. General Status Menu

The **Status→General** Menu provides enabling the access to monitor system parameters. Refer also to Figure 3-4 for the sub-menu structure.

3.3.2.1. Encoder Software Version Display

The **Encoder Software Version** item in the **Encoder Status→General** Displays the Software and Front Panel Version Numbers.

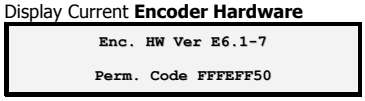
Display Current **Encoder Software Version**



3.3.2.2. Encoder Hardware Version Display

The **Encoder Hardware Version** item in the **Encoder Status→General** Displays the Hardware and Panel Permission Numbers.

Display Current **Encoder Hardware**

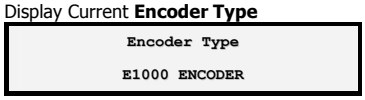


3.3.2.3. Encoder Type Display

The **Encoder Type** item in the **Encoder Status→General** Displays the type of encoder provided:

E1000, E90, E100, E900A, E1510, E1710

Display Current **Encoder Type**



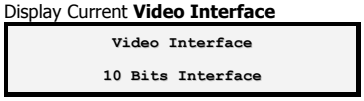
3.3.2.4. Video Interface Display

The **Video Interface** item in the **Encoder Status→General** Displays the type of input interface provided:

Valid options:

- **TEN BIT A/D With D.N.R:** Supports the Composite/Component Video Input Panel.
- **TEN BIT A/D + DIGITAL:** Supports the Composite/SDI Video Input Panel.
- **TEN BIT A/D:** Supports the Composite Video Input Panel.
- **DIGITAL With VBI DECD:** Supports the SDI Video Input Panel.
- **EIGHT BIT A/D (Old option):** Supports the 8-bit A/D Video Interface Card.
- **DIGITAL INTERFACE (Old option):** Supports the Digital Video Interface Card.

Display Current **Video Interface**

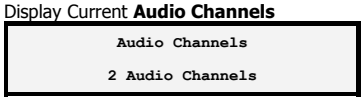


3.3.2.5. Audio Channels Display

The **Audio Channels** item in the **Encoder Status→General** Displays the number of audio channels available:

- **Two Audio Channels**
- **Four Audio Channels**

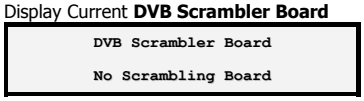
Display Current **Audio Channels**



3.3.2.6. DVB Scrambler Board Display

The **DVB Scrambler Board** item in the **Encoder Status→General** Displays if the DVB Scramble **Board EXIST** or **No Board** is installed.

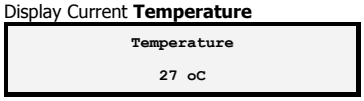
Display Current **DVB Scrambler Board**



3.3.2.7. Temperature Display

The **Temperature** item in the **Encoder Status →General** Displays the current operating temperature of the unit.

Display Current **Temperature**



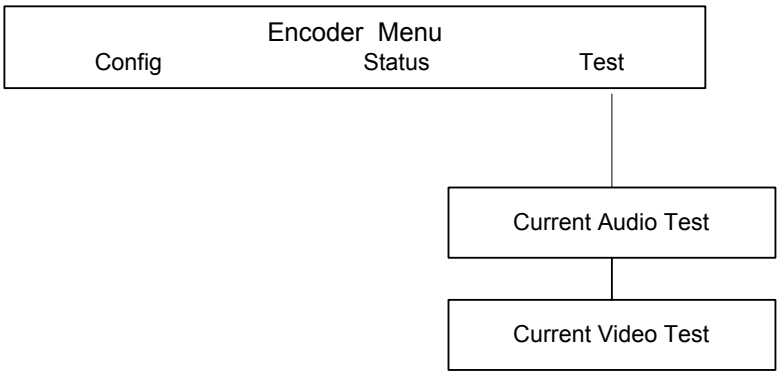
3.4. TEST MENU

The Encoder Test menu enables access to the System Configuration Test function. Figure 3-5 shows the Test Menu structure. The paragraphs below describe the parameters available for each function.

Menu Operation

- Navigating (**UP** / **DOWN** touch pads) in the menu displays the various parameters available. Each parameter is displayed with the "**Current**" label preceding the "**Parameter**" label on the top line of the LCD and the current active option on the bottom line.
- Selecting the parameter for configuration changes the "**Current**" label to "**Selelct:**" label and enables the user to navigate through the valid options available for each parameter. The current active option is marked by an asterisk (*).
- Enabling a test starts the test pattern insertion. To terminate the test, the test must be disabled. Enabling or disabling a test requires confirmation, as detailed in paragraph above.

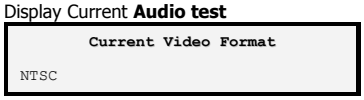
Figure 3-5: Encoder Test Menus



3.4.1. Test menu→Audio test

The **Audio Test** item in the **Test** Menu Activates (**ENABLED**) or deactivates (**DISABLED**) the audio pattern source self-test.

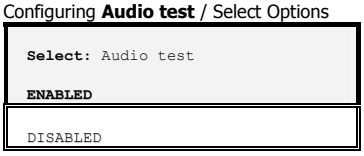
Display Current **Audio test**



Pressing the **[Enter]** keypad enables setting up the item value.

Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter]**.

Configuring **Audio test** / Select Options



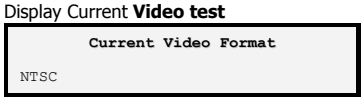
Valid Options:

- **DISABLED**
- **ENABLED**

3.4.2. Test menu→Video test

The **Video Test** item in the **Test** Menu Activates (**ENABLED**) or deactivates (**DISABLED**) the video pattern source self-test.

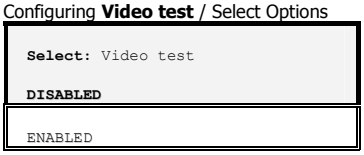
Display Current **Video test**



Pressing the **[Enter]** keypad enables setting up the item value.

Navigate by **[Up]** / **[Down]** to select an option and confirm selection by **[Enter]**.

Configuring **Video test** / Select Options



Valid Options:

- **DISABLED**
- **ENABLED**

Section 4
ADVANCED OPERATION

4.1. GENERAL

This Section provides information regarding advanced functions available for E-1000 Series Encoder users.

4.2. MANAGEMENT OF ENCODER SOFTWARE

This section provides information and procedures required to perform management actions on the encoder software and software storage tools.

The procedures for software loading and for software upgrade are identical. New software for the encoder is supplied in two files:

- **e1ksw.arj** (approx. 1.1-1.2 MB)
  This file holds system software files, compressed with the ARJ compression algorithm.
- **e1ksw.bat** (approx. 1300-1500 bytes)
  This batch file extracts the files stored in the **e1ksw.arj** archive into the directory of the Encoder.

NOTE

New software versions are provided in compressed format using the ARJ algorithm. ARJ decompressing of the files is not necessary during the software installation.

CAUTION

*SOFTWARE UPDATING MUST BE PERFORMED WITH THE STATISTICAL MULTIPLEXER SHUT-OFF AND THE NMS DISCONNECTED. THE NMS AND STAT-MUX. CAN BE TURNED ON **ONLY** AFTER THE SYSTEM HAS BEEN SUCCESSFULLY UPDATED (I.E., THE PANEL VERSION NUMBER HAS BEEN CHANGED TO THE NEW VERSION).*

CAUTION

WHEN COPYING FILES, MAKE SURE THAT THE COPIED FILES ARE NOT LIMITED FOR READ-ONLY. READ-ONLY MARKED FILES MAY ABORT THE AUTOMATIC INSTALLATION OF THE NEW SOFTWARE VERSION.

The installation procedure loads the system software to the encoder in a compressed format. Once loaded, the encoder must then be powered OFF and back ON to activate the updated software. During initialization, the compressed files are automatically extracted and the encoder is configured with the parameters used prior to the software upgrade. If the panel version was changed, the initialization process will upgrade the panel as well.

NOTE

If difficulties arise during installation/update, copy the e1ksw.log log file (generated at the same directory where the version is currently saved) and Send the e1ksw.log file to the technical support person and request assistance.

4.2.1. Terminal Set-Up

The following procedure describes how to set-up the terminal communication to the encoder.

a. Make sure the terminal is properly connected to the encoder using one of the following options
   - Direct connection, over RS-232 interface (see paragraph 4.2.2 below for details), used when it is required to view the contents of the encoder configuration files.
   - Ethernet connection, over TFTP interface (see paragraph 4.2.3 below for details), used when it is required to update or edit the contents of the encoder configuration files.

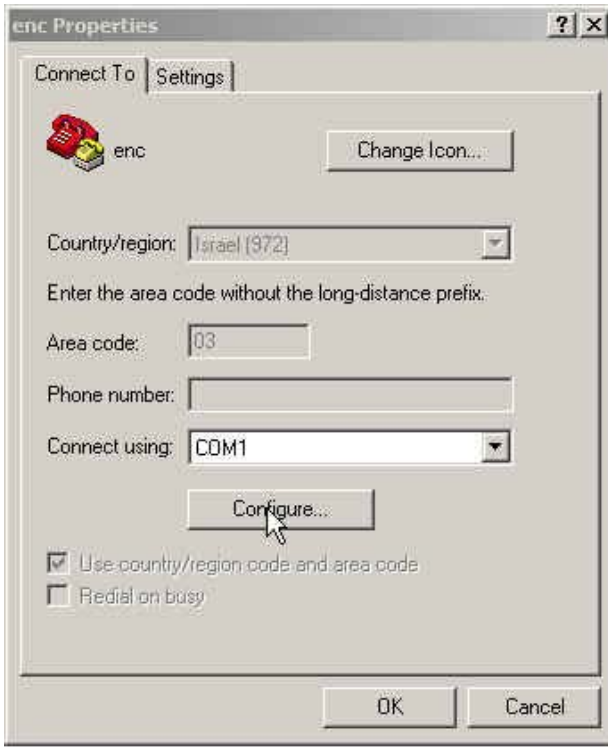
b. Activate the Hyper Terminal from the PC. The HyperTerminal Main Window is displayed.

c. Select from the Menu Bar on the HyperTerminal Main Window the "File" → "Properties" option. The HyperTerminal Properties Window is displayed (see Figure 4-1):

d. Set-Up the terminal parameters (see Figure 4-1):

1. Enter the COM number designated for the encoder into the "connect using:" field to connect the terminal to the encoder.

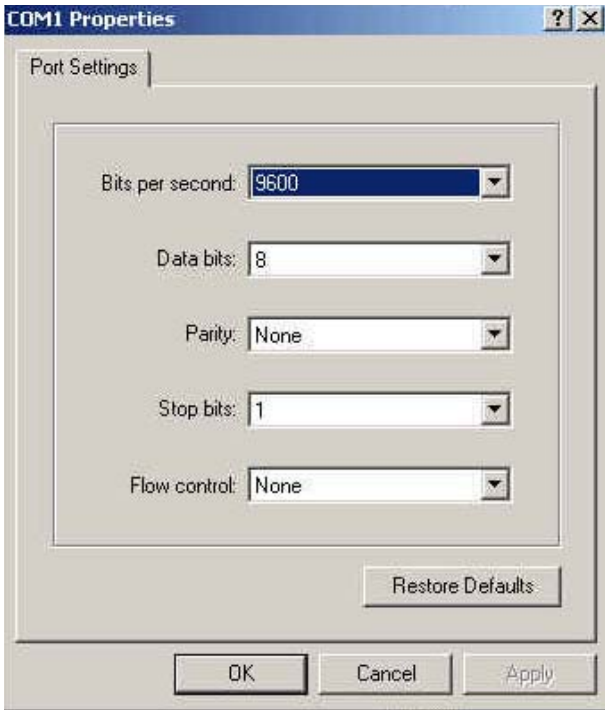
Figure 4-1: HyperTerminal Properties Window - Example



2. Press "Configure" to display the Terminal Configuration Window and set the following parameters for the terminal (see Figure 4-2):

- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

Figure 4-2: HyperTerminal Set-Up Sequence - Example



3. Press "f" to ensure that the terminal is connected (the encoder status is displayed (see Figure 4-3):

Figure 4-3: HyperTerminal Set-Up Sequence - Example

```
 =====       Scopus Network Technologies, E1X00 Encoder=====
 ============       Boot Loader Version(0) 1.54============
 ============       E1000 MIB File Version 01.28============
)I) (1)1:43:42 ==== Encoder is started====
)I) (1)1:43:55 ==== Initialization done====
```

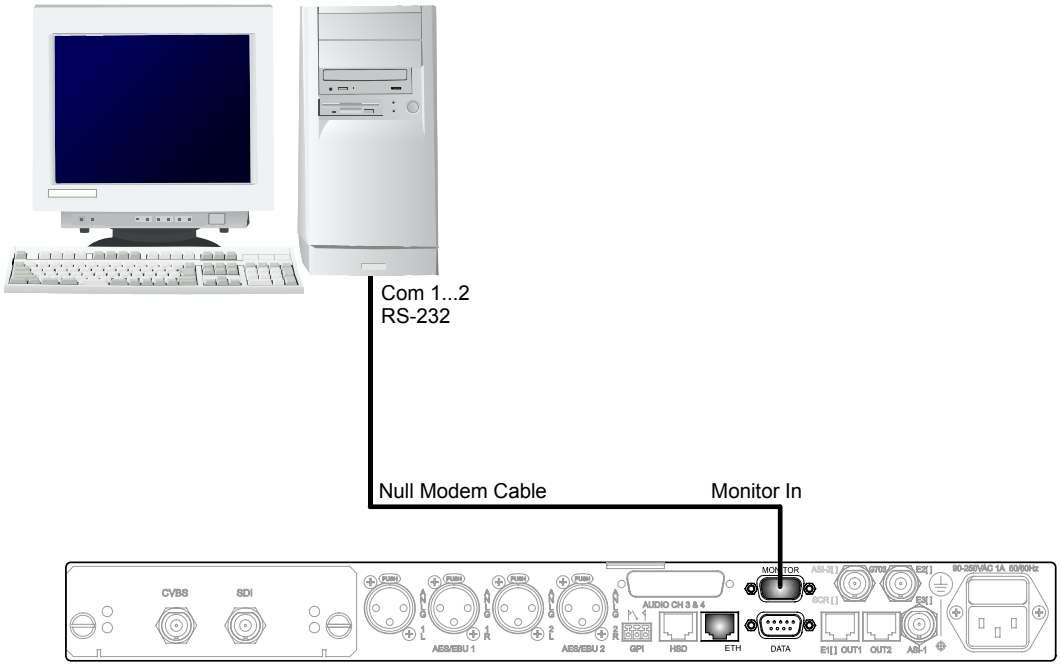
4.2.2. View Encoder Configuration on Local PC

The following procedure provides a fast way to review the current configuration of the encoder (provided on the "encoder.cfg" configuration file, for details, see paragraph 4.3.2 ahead).

This procedure describes how to view the contents of files in the encoder by using the Windows HyperTerminal data communication program. It requires connecting the Encoder to a local PC, via a standard RS-232 interface, using a standard Null Modem Cable.

a. Use the null modem cable to connect any RS-232 COM Input on the PC to the MONITOR connector on the E-1000 Encoder rear panel (refer to Figure 4-4 for interconnection topology).

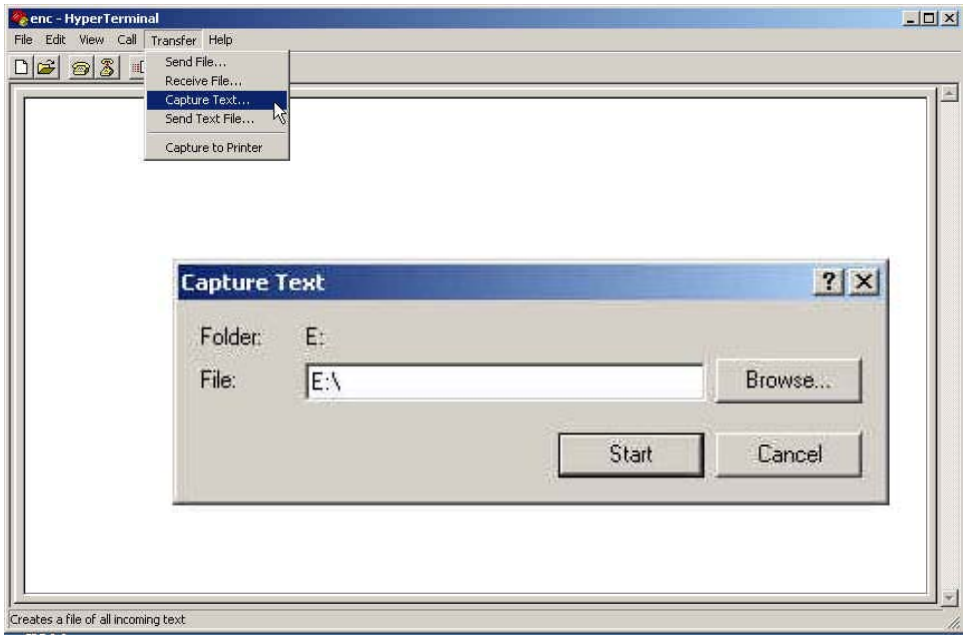
Figure 4-4: RS-232 Connection Topology



b. Activate and set-up the Hyper Terminal from the PC according to the procedure described in paragraph 4.2.1.

c. In the HyperTerminal Main Window Menu, select **transfer → capture text**.
The Capture Text Window is displayed (see Figure 4-5).

Figure 4-5: HyperTerminal Capture Text Window - Example



d. Type the path and file name of the file to be copied (example; C\: encoderconfig.txt) and press: "start" key on the keyboard.

e. Copy the file to the terminal according to the following steps:

   1. Type: "Esc"
   2. Type: "Y"
   3. On Login request, Enter: "com"
   4. On password request press: **[Enter]** Key
   5. Type "cat encoder.cfg" and press **[Enter]** Key.

f. The text of the encoder.cfg file is running on the screen.
Once the file run is completed, press "transfer" → "capture text" → "stop".

g. Check that the encoder.cfg file has been successfully copied into the PC.

NOTE

To file-up or download software files to the Encoder, use the TFTP tools (refer to paragraph 4.2.3).

4.2.3. TFTP Connection and Set-Up

TFTP stands for "Trivial File Transfer Protocol". This protocol provides the tools required to update or edit the contents of the encoder configuration files (the "encoder.cfg" file. For details, see paragraph 4.3.2 ahead). Use of the TFTP tools requires the encoder to be connected to local or remote PC, via an Ethernet connection.

NOTE

Any TFTP Application should provide the tools required to update or edit the encoder.cfg file. The following procedures use the TFTP PumpKIN Application.

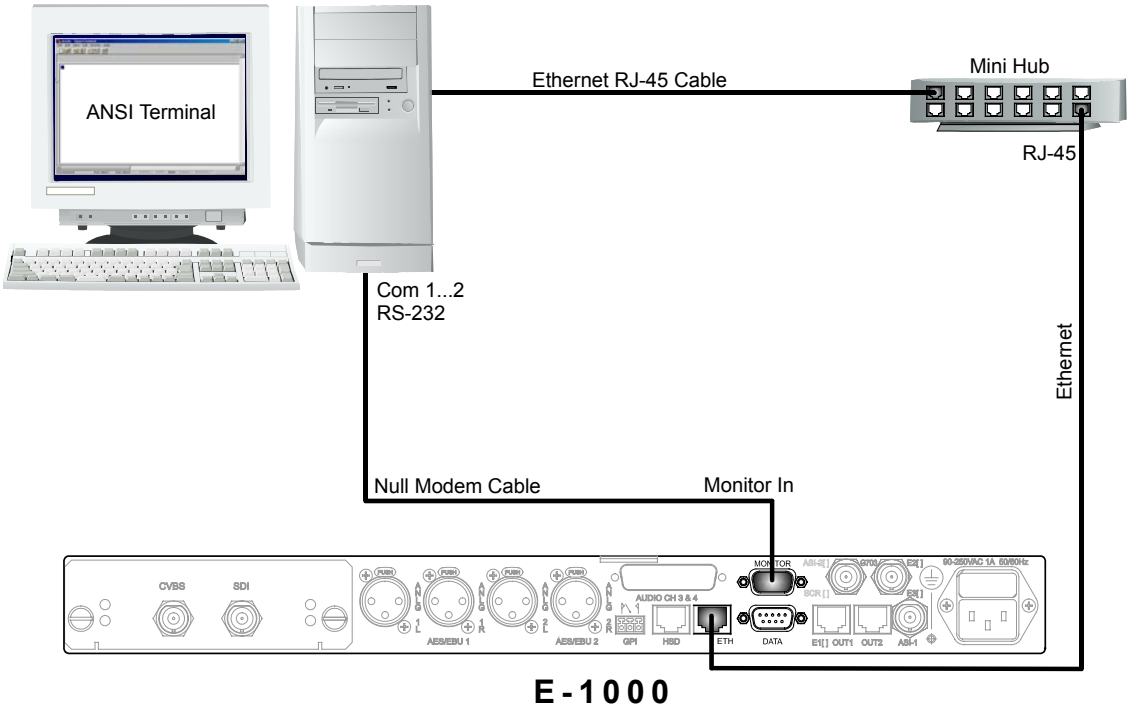
This freeware tool is available for download at ftp:||www.klever.net.

The following procedure describes how to connect and set-up the Encoder and the PC for using the TFTP interface.

a. Set-up the PC connection to the Encoder and the Ethernet according to the following steps (refer to Figure 4-6 for TFTP interconnection topology):

   1. Use a null modem cable to connect the MONITOR connector on the encoder rear panel and the COM connector on the PC.
   2. Use an RJ-45 Ethernet cable to connect the PC to the network, via a Mini Hub.
   3. Use an RJ-45 Ethernet cable to connect between the ETH connector on the encoder rear panel and the network, via a Mini Hub.

Figure 4-6: TFTP Connection Topology



b. Activate the Encoder and configure the Encoder TCP/IP properties to be on the same network as the encoder by using the following functions in the **Config > Service > Advance** Front Panel Menu:

   1. Set the Encoder IP Number; Use the **Select IP Number:** function.
   2. Set the Encoder Gateway (GW) IP Number: Use the **GW Number:** function.

NOTE

The Gateway IP Number defines the sub-net area where the E-1000 is located.

c. Activate and set-up the Hyper Terminal from the PC according to the procedure described in paragraph 4.2.1.

d. Transfer control on the encoder to the terminal according to the following steps (see example in Figure 4-7):

   1. Press "Esc" to EXIT. Acknowledge exit by pressing "Y" to the message "Are you sure?"
   2. Type "com " in the "login" section and then press **[Enter]** Key.
   3. In "Password" section, press **[Enter]** Key. Check that the shell prompt (com>) is displayed.

Figure 4-7: Encoder Control Transfer - Example

```
Are you sure ? Yes

Use 'com' for Terminal login, 'lan' for Telnet login.
Use '?' for commands list.
Login: com
Password :

Copyright (c) Integrated Systems, Inc., 1992.
Welcome to pSOSystem...

com>
```

e. Type "x mdd 20" and press **[Enter]** Key to check the Flash Disk.

CAUTION

*CONTINUE ONLY IF THE "**FLASH DISK CHECK - OK**" MESSAGE IS RECEIVED.*

f. Configure the Terminal TCP/IP properties to be on the same network as the encoder:

CAUTION

THE ENCODER IP AND THE TERMINAL IP SHOULD BE ON THE SAME SUB-NET AREA.

1. Set the Encoder IP Number.
   Type "x flash ip {IP Address]" and press **[Enter]** Key.
   Where: {IP Address] is the specific IP address of the encoder (example, 100.100.100.10)
2. Set the Encoder Gateway IP Number.
   Type "x flash gw {GW Address]" and press **[Enter]** Key.
   Where: {GW Address] is the specific Gateway IP address of the encoder
   (example, 100.100.100.2)
3. Set the Encoder IP NetMask Number.
   Type "x flash mask {NetMask Address]" and press **[Enter]** Key.
   Where: {NetMask Address] is the specific Hexadecimal NetMask IP address of the encoder (example, the Hex FFFFFF00 represents the 255.255.255.0 address)
4. Type "x flash save" and press **[Enter]** Key.
   Once the save procedure is successfully completed, the "Update Done OK" is displayed.
5. Type "boot " and press [**Enter**] Key to restart the encoder.

Figure 4-8 shows an example of the TFTP TCP/IP Update sequence.

Figure 4-8: TFTP TCP/IP Update Sequence - Example

```
com> x flash ip 100.100.100.11
com> x flash gw 100.100.100.2
com> x flash mask ffffff00
com> x flash save

Update Done OK

com> sync
com> boot

 =====         Scopus Network Technologies, E1X00 Encoder=====
 ============        Boot Loader Version(0) 1.52============
 ============        E1000 MIB File Version 01.25============
)I) (1)1:9:34 ==== Encoder is started====
)I) (1)1:9:40 ==== Initialization done====
```

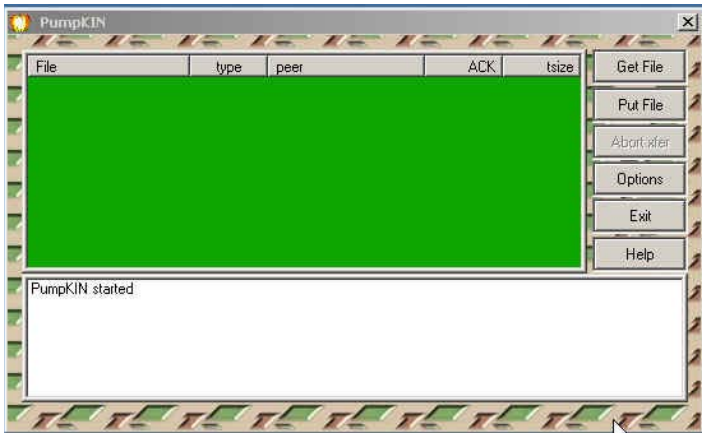
g. Type " tftp " and press [**Enter**] Key to activate the TFTP Server.

CAUTION

*CONTINUE ONLY IF THE "**TFTP SERVER IS ACTIVATED/STARTED/ALREADY ACTIVE**" MESSAGE IS RECEIVED.*

h. Activate the "TFTP PumpKIN" application on the PC. The TFTP PumpKIN Main Window is displayed (See Figure 4-9).

Figure 4-9: "TFTP PumpKIN" Application - Main Window

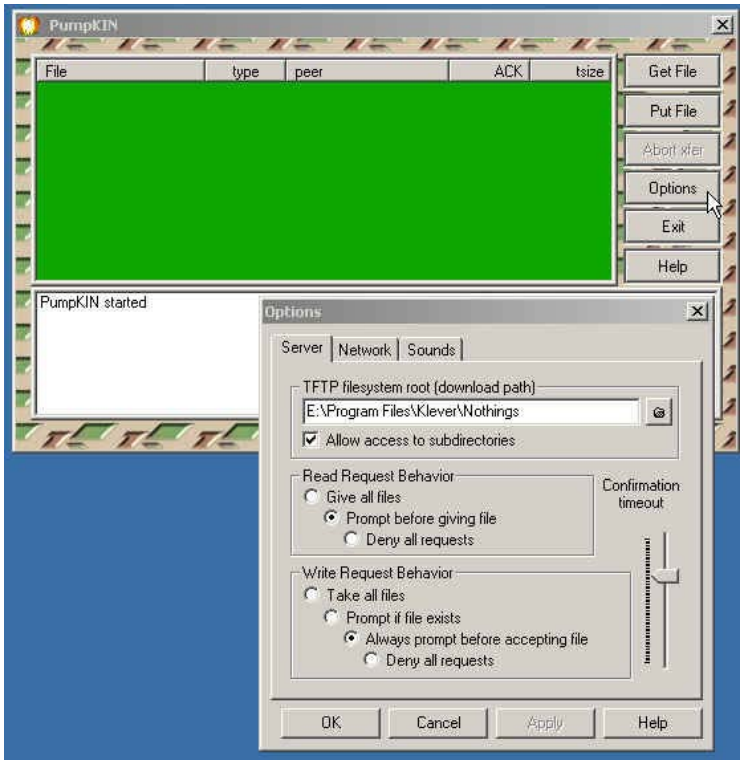


i. Press "Options" in the main window. The TFTP PumpKIN Options Window is displayed (See Figure 4-10). Press "O.K." to confirm.

NOTE

During the initial activation, it is recommended to change the "TFTP file system root" to a known folder, previously opened, which contains the two file versions.

Figure 4-10: "TFTP PumpKIN" Application - Options Window



4.2.4. Formatting the Flash Disk

Formatting the Encoder Flash Disk requires specialized tools, such as the formatting program **"fdformat.elf"**, supplied with the encoder software.

The "**fdformat.elf**" program formats the disk in standard DOS notation while leaving space for special software information. Any DOS-operated software and tools recognize the format generated by this program.

CAUTION

DO NOT *FORMAT THE FLASH DISK USING THE STANDARD PC OR LAPTOP FORMATTING TOOLS. FLASH DISK FORMATED BY THESE TOOLS WILL* ***IMMEDIATELY*** *CRASH WHEN ATTEMPTING TO UPDATE THE SOFTWARE.*

Format the Flash Disk according to the following steps:

a. If required, prepare the system for Flash Disk formatting according to the following steps:
   1. Make sure that the proper physical and electrical connection of the Encoder and the HyperTerminal is complete and both units are activated (see paragraph 4.2.3 above).
   2. Press "f" to ensure that the terminal is connected (the encoder status is displayed).
   3. Press **[Esc]** to EXIT. Acknowledge exit by pressing "Y" to the message "are you sure?"
   4. Power off the encoder.

b. Prepare the Flash Disk for formatting according to the following steps:
   1. Remove the Flash Disk from the encoder and reboot the encoder. This action makes the RAM disk the default mass-storage memory while the encoder boots.
   2. After the boot process has been completed, re-insert the Flash Disk into the Encoder.
   3. Invoke the "openfd" shell command to initialize the O/S partition information (unique to each Flash Disk).
   4. Invoke the "fdfrmt" shell command to format the Flash Disk as an O/S native-file system and load the file system.

5. Once the Flash Disk formatting is successfully completed, the "Flash Disk Mounted as pHILE+ file system" message is displayed.

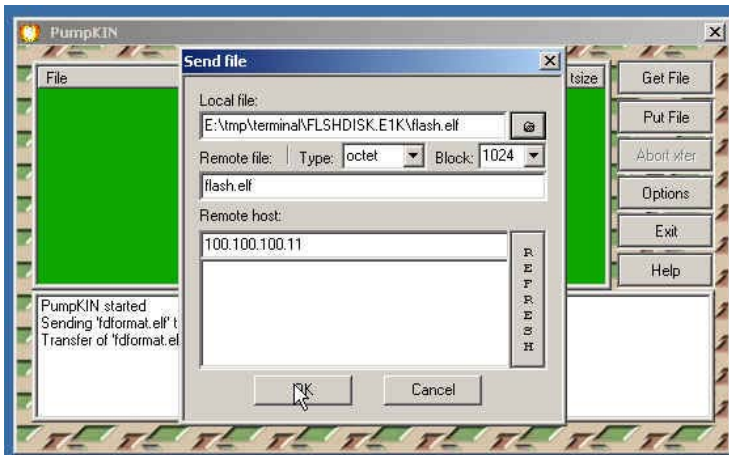
Figure 4-10 shows an example of the Flash Disk set-up for formatting sequence.

Figure 4-11: Flash Disk Set-Up for Formatting - Sequence Example

```
   Scopus Network Technologies, E1X00 Encoder=====

*******************************
    *       FlashDisk Mount Failed*   .
 *       FlashDisk might be missing* ?
    *       Working with RAMDISK*    !
*******************************

 ============       Boot Loader Version(0) 1.54=============
 ============       E1000 MIB File Version 01.28============

Use 'com' for Terminal login, 'lan' for Telnet login.
Use '?' for commands list.

Login: com

Password :

Copyright (c) Integrated Systems, Inc., 1992.
Welcome to pSOSystem...

com> openfd

com> fdfrmt

Flash Disk Mounted as pHILE+ file system
```

c. Copy the "fdformat.elf" and the "flash.elf" commands into the Shell RAM disk (volume 3.0.0), using the TFTP PumpKIN tools (see Figure 4-12):

Figure 4-12: Copy to Shell RAM Disk - Using TFTP PumpKIN



d. Invoke the "fdformat.elf" application, to reformat the Flash Disk according to encoder requirements:

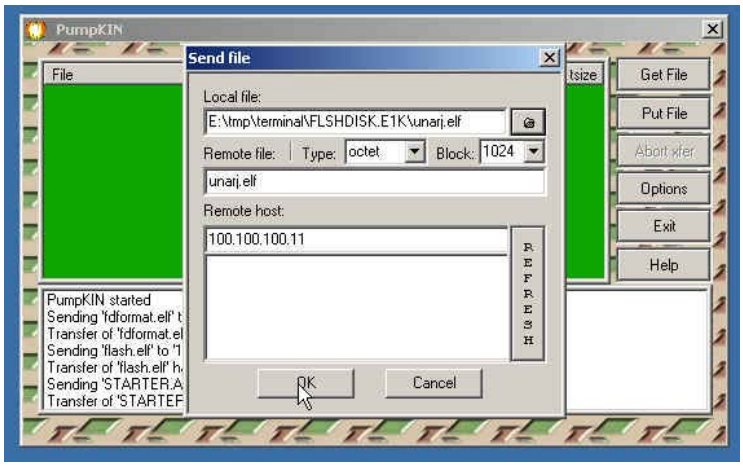
   1. Type "x fdformat 8" and press **[Enter]** Key.
   2. Type "Y" in response to the "Continue (Y/N)" request.
   3. Once the "Flash Disk Format Completed" message is displayed, type "boot" and press **[Enter]** Key to re-boot the system.
      Figure 4-13 shows an example of the Flash Disk formatting sequence.

Figure 4-13: Flash Disk formatting Sequence - Example

```
com> x fdformat 8

 This program erases the content of the Flash Disk.
 Make sure you have an 8M Flash Disk unit.
 You can replace the Flash Disk unit now in order to format a
faulty unit.

 Continue (Y/N) ? y
Flash Disk Format Completed

com> boot

 =====       Scopus Network Technologies, E1X00 Encoder=====

 ============       Boot Loader Version(0) 1.54=============
 ============       E1000 MIB File Version 01.28============

Use 'com' for Terminal login, 'lan' for Telnet login.
Use '?' for commands list.
Login: com
Password :

Copyright (c) Integrated Systems, Inc., 1992.
Welcome to pSOSystem...
```

e. Copy the "starter.arj" and "unarj.elf", files into the Flash RAM Disk (volume 4.0.0) using the TFTP PumpKIN tools (see Figure 4-14):

Figure 4-14: Copy to Flash RAM Disk - Using TFTP PumpKIN



f. Activate the "x unarj x starter" shell command to extract the Starter files. Wait for the Starter files extraction to complete.

Figure 4-15 shows an example of the Encoder Starter files extraction.

Figure 4-15: Encoder Starter Files Extraction - Example

```
Copyright (c) Integrated Systems, Inc., 1992.

Welcome to pSOSystem...

com> x unarj x starter
Processing archive: starter.ARJ
Archive date      : 2002-12-17 07:15:48
Extracting RM.ELF                      (|)CRC OK
Extracting FLASH.ELF                  (/)CRC OK
Extracting MV.ELF                      (\)CRC OK
Extracting UX.ELF                      (|)CRC OK
Extracting FILEXFER.ELF                (/)CRC OK
Extracting RP_N_PNL.ELF                (-)CRC OK
 6    file(s(
```

g. Type "x mdd 0" and press **[Enter]** Key to check the Flash Disk. The message "OK" is displayed if the Flash Disk is functional.

CAUTION

*CONTINUE ONLY IF THE "**FLASH DISK CHECK - OK**" MESSAGE IS RECEIVED.*

4.2.5. Update Encoder Software Files Using TFTP Tools

The following procedure describes how to copy files using the TFTP interface.

a. If required, prepare the system for file copying according to the following steps:

1. Make sure that the proper physical and electrical connection of the Encoder and the HyperTerminal is complete and both units are activated (see paragraph 4.2.3 above).
2. Press "f" to ensure that the terminal is connected (the encoder status is displayed).
3. Press "Esc" to EXIT. Acknowledge exit by pressing "Y" to the message "are you sure?"
4. Type "com " in the "login" section and then press **[Enter]** Key.
5. In "Password" section, press **[Enter]** Key. Check that the shell prompt (>com) is displayed.
6. Type "x mdd 20" and press **[Enter]** Key to check the Flash Disk.

CAUTION

*CONTINUE ONLY IF THE "**FLASH DISK CHECK - OK**" MESSAGE IS RECEIVED.*

7. Type " tftp " and press **[Enter]** Key to check that the TFTP Server is activated.

CAUTION

*CONTINUE ONLY IF THE "**TFTP SERVER IS ACTIVATED/STARTED/ALREADY ACTIVE**" MESSAGE IS RECEIVED.*

b. Operate the "TFTP PumpKIN" application on the PC. Check that the TFTP PumpKIN Main Window is displayed (See Figure 4-9 above).

c. Select "Put File" in the TFTP PumpKIN Main Window.

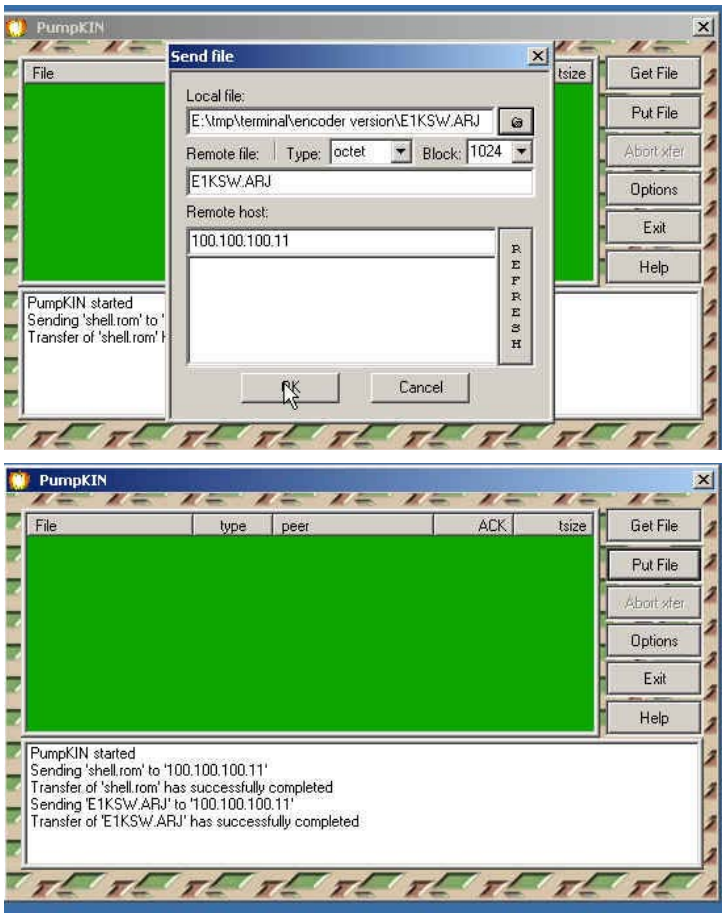
d. Type "e1ksw.arj" in the "Local file" section. The system automatically moves to the "Remote file" section.

e. Type the IP number of the Encoder "{E-1000 IP No]" in "Remote host" section.
Press "O.K." to send it.

f. The "PumpKIN" application displays the "Sending e1ksw.arj to {E-1000 IP No]" message and confirms file transfer by displaying the "Transfer of e1ksw.arj has successfully completed" message.

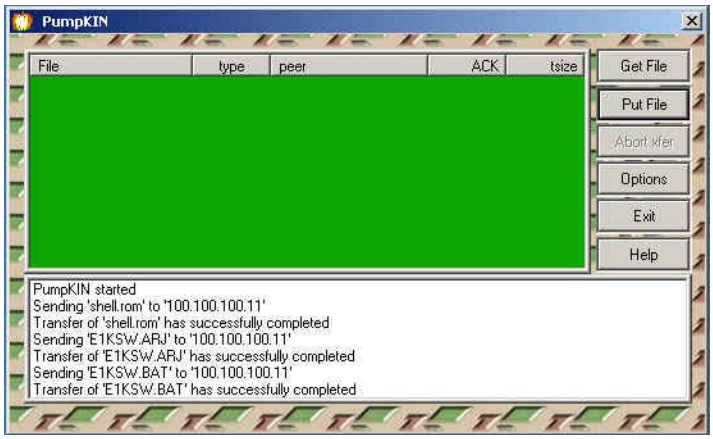
Figure 4-16 shows the TFTP PumpKIN Send File Window and the response to a successful file transfer.

Figure 4-16: TFTP PumpKIN transfer of "e1ksw.arj" File



g. Repeat steps **'a'** to **'f'** to transfer the "e1ksw.bat" file. The "PumpKIN" application displays the "Sending e1ksw.bat to {E-1000 IP No]" message and confirms file transfer by displaying the "Transfer of e1ksw.bat has successfully completed" message (see Figure 4-17).

Figure 4-17: TFTP PumpKIN Confirmation of "e1ksw.bat" File Transfer



h. At the terminal, type "sync " and press **[Enter]** Key.

i. Type "boot " and press **[Enter]** Key to restart the encoder. The encoder starts installing the upgrade.

j. The "e1ksw.bat" application starts the extraction and installation of the files in the "e1ksw.arj" file and a list of opened files is displayed on the monitor.

k. Once the installation is completed, the following message is displayed:
e1ksw.arj deleted
The SW Version Update Completed.

l. On the encoder front panel, the encoder status display should indicate STATUS OK.

Figure 4-18 shows an example of the Software Upgrading Procedure sequence.

Figure 4-18: TFTP Software Upgrading - Sequence Example

```
com> sync

com> boot

 =====       Scopus Network Technologies, E1X00 Encoder=====
 ============       Boot Loader Version(0) 1.54=============
 ============       E1000 MIB File Version 01.28============
Processing archive: e1ksw.arj
Archive date      : 2003-06-15 09:31:28
Testing    ARBITER.ELF             (|)CRC OK
Testing    AUDIO.ELF                (/)CRC OK
Testing    AUTOEXEC.BAT              (\)CRC OK
Testing    COD_FIFO.ELF               (|)CRC OK
Testing    CONVERTC.ELF               (\)CRC OK
Testing    CP.ELF                    (|)CRC OK
```

```
Extracting UCODES\SIFPAL.UX           (/)CRC OK
Extracting UCODES\PAL.UX              (/)CRC OK
 70   file(s(
E1KSW.ARJ        deleted
SW Version update Completed

 =====       Scopus Network Technologies, E1X00 Encoder=====
 ============       Boot Loader Version(0) 1.54=============
 ============       E1000 MIB File Version 01.28============
)I) (1)1:43:42 ==== Encoder is started====
)I) (1)1:43:55 ==== Initialization done====
```

4.2.6. Update Encoder Shell Using TFTP Tools

The following procedure describes how to update the Shell Flash ROM in the Encoder, using the TFTP interface.

a. If required, prepare the system for file copying according to the following steps:

1. Make sure proper physical and electrical connection of the Encoder and HyperTerminal is complete and both units are activated (see paragraph 4.2.3 above).
2. Press "f" to ensure that the terminal is connected (the encoder status is displayed).
3. Press "Esc" to EXIT. Acknowledge exit by pressing "Y" to the message "are you sure?"
4. Type "com " in the "login" section and then press **[Enter]** Key.
5. In "Password" section, press **[Enter]** Key. Check that the shell prompt (>com) is displayed.
6. Type "x mdd 20" and press **[Enter]** Key to check the Flash Disk.

CAUTION

*CONTINUE ONLY IF THE "**FLASH DISK CHECK - OK**" MESSAGE IS RECEIVED.*

7. Type " tftp " and press **[Enter]** Key to check that the TFTP Server is activated.

CAUTION

*CONTINUE ONLY IF THE "**TFTP SERVER IS ACTIVATED/STARTED/ALREADY ACTIVE**" MESSAGE IS RECEIVED.*

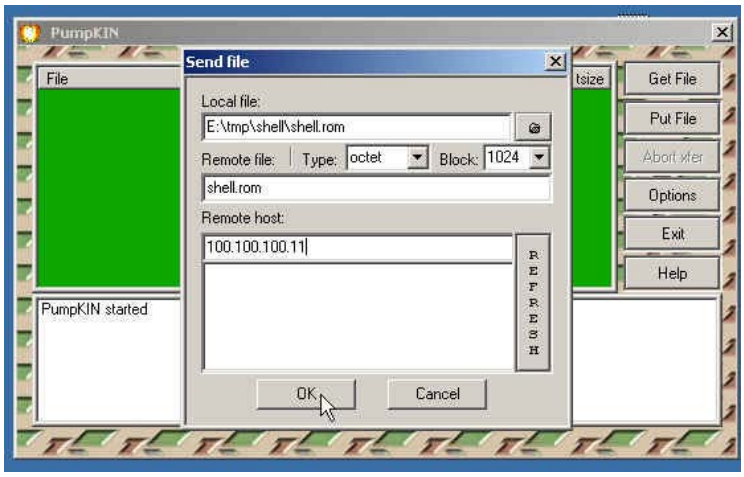
8. Operate the "TFTP PumpKIN" application on the PC. Check that the TFTP PumpKIN Main Window is displayed (See Figure 4-9 above).

b. Select "Put File" in Main Window.

c. Type "shell.rom" in the "Local file" section. The system automatically moves to the "Remote file" section.

d. Type the IP number of the Encoder "{E-1000 IP No]" in "Remote host" section.
Press "O.K." to send it (see Figure 4-19).

Figure 4-19: TFTP PumpKIN Transfer of "shell.rom" File



e. The "PumpKIN" application displays the "Sending shell.rom to {E-1000 IP No]" message and confirms file transfer by the "Transfer of shell.rom has successfully completed" message.

CAUTION

DO NOT POWER OFF THE ENCODER DURING SHELL UPDATING. THIS MAY CAUSE THE LOSS OF ALL DATA.

f. At the terminal, type "x flash prog shell.rom" and press **[Enter]** Key to update the Shell Flash ROM information.

g. Type " x flash ver shell.rom" and press **[Enter]** Key to verify the correct update of the Shell Flash ROM information.

h. Once the Shell Update Verification sequence is completed, reboot the encoder.

Figure 4-20 displays an example of the the shell update sequence.

Figure 4-20: Shell Update - Sequence Example

```
com> x flash prog shell.rom
.................................................................
File read : OK. Starts : 0x100, Ends : 0xBFC10
Erasing FLASH (0x00000-0xBFFFF)
Programming FLASH (0x00000-0xBFC10)
com <

com> x flash ver shell.rom
.................................................................
File read : OK. Starts : 0x100, Ends : 0xBFC10
Verify flash programming (0x00000000-0x000BFC10)
Verify Ended : OK
com > boot
```

i. Update the encoder files, using the procedure described in paragraph 4.2.5 above.

4.2.7. Display Encoder Shell Data Using the Terminal

The following procedure describes how to display the information stored in the encoder shell using the Terminal.

a. If required, activate the terminal according to the following steps:

   1. Make sure proper physical and electrical connection of the Encoder and Terminal is complete and both units are activated (see paragraph 4.2.3 above).
   2. Press "f" to ensure that the terminal is connected (the encoder status is displayed).
   3. Press "Esc" to EXIT. Acknowledge exit by pressing "Y" to the message "Are you sure?"
   4. Type "com " in the "login" section and then press **[Enter]** Key.
   5. In "Password" section, press **[Enter]** Key. Check that the shell prompt (>com) is displayed.

b. Type "x flash show" and than press **[Enter]** Key to display the Encoder Shell contents (see Figure 4-21). Table 4-1 describes the information displayed.

Figure 4-21: Encoder Shell Contents - Example

```
com> x flash show
Magic Number .. : 'E1K0'
IP ............ : 100.100.100.10
GW ............ : 100.100.100.1
MAC ........... : 00-50-C2-01-C8-FD
HW_version .... : 8 (Board:E9) (450908)
Encoder Options : FFFFFF70 FFFFFFFF FFFFFFFF FFFFFFFF
Encoder Options : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
Encoder Options : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
Encoder Options : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
User Options .. : FFFFFFE7 FFFFFFFF FFFFFFFF FFFFFFFF
User Options .. : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
User Options .. : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
User Options .. : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
Checksum ...... : 28722284
Magic Number .. : 'E1K0'
NetMask ....... : 255.255.255.0 (FFFFFF00)
Checksum ...... : BACEB5E0
```

Table 4-1: Encoder Shell Contents Description

SHELL ITEM	ITEM DESCRIPTION
Magic Number	Encoder Magic number. Example: E1K0
IP Address	The IP Address of the Encoder, displayed in binary code (address) format. Example: 100.100.100.10
GW	The Gateway (GW) Address of the Encoder, displayed in binary code (address) format. Example: 100.100.100.1
MAC	Encoder unique Ethernet address. Used as an ID for the encoder. Displayed in hexadecimal format. Example: 00-50-C2-01-C8-FD
HW_version	Displays the current version of the encoder hardware. Example: HW_version: 8 (Board: E9) (450908) **Where**: 8 = Hardware version number. Board: E9Main board version number (450908)Scopus version code
Encoder Options	16 Encoder Option Words (Encoder_Word00 thru Encoder_Word15). Used to define the encoder activated options. Refer to Table 4-2 for option descriptions.
User Options	16 User Option Words (User _Word00 thru User _Word15). Used to define the user activated options: Example: FFFFFFE7 **Where**: E = SNMP Enabled 7 =TFTP Enabled
Checksum	User Options checksum
Magic Number	Encoder Magic number
NetMask	Encoder NetMask, displayed in binary and hexadecimal format.
Checksum	NetMask checksum

4.2.8. Update Encoder Options

The following procedure describes how to update the Encoder Options in the Encoder.

NOTE

Changing the Encoder Options requires Scopus permission. This permission is provided by a unique Encoder Option Code, associated with the encoder unique MAC Address.

To receive the Encoder Option Code, Scopus needs to know the Encoder MAC Address (this address is displayed in the Shell Flash Content screen (see Figure 4-21).

a. If required, prepare the system for file copying according to the following steps:

1. Make sure proper physical and electrical connection of the Encoder and HyperTerminal is complete and both units are activated (see paragraph 4.2.3 above).
2. Press "F" to ensure that the terminal is connected (the encoder status is displayed).
3. Press "Esc" to EXIT. Acknowledge exit by pressing "Y" to the message "are you sure?"
4. Type "com " in the "login" section and then press **[Enter]** Key.
5. In "Password" section, press **[Enter]** Key. Check that the shell prompt (>com) is displayed.
6. Type "x mdd 20" and press **[Enter]** Key to check the Flash Disk.

CAUTION

*CONTINUE ONLY IF THE "**FLASH DISK CHECK - OK**" MESSAGE IS RECEIVED.*

b. At the terminal, type "x flash enc {encoder_wordn].{option-code] {pass_word]" and press **[Enter]** Key to update the new encoder options in the encoder shell.

Where

{encoder_wordn].is the encoder word number (00 - 15) to be updated.

{option-code] is the new word containing the activation code for the encoder option.

{pass_word] is the unique pass-word provided by Scopus to activate the new option authorization.

c. Type "x flash save" and press **[Enter]** Key to save the new encoder options in the encoder shell. Once the save is completed, the following message is displayed:"Update Done OK"

Table 4-2 lists the options available for the encoder and the respective encoder words.

Figure 4-22 shows an example of the Encoder Options Update sequence.

Table 4-2: Encoder Options Description

Option Word	Encoder OptionS											
	4:2:2 Profile	TTX	StatMux	Cascading	Basic Encr.	Audio Only	52M	VBI over SDI	QPSK	AC3		
FFFFFFFF	-	-	-	-	-	-	+	-	-	-		
FFFFFFFE	+	-	-	-	-	-	-	-	-	-		
FFFFFFFD	-	+	-	-	-	-	-	-	-	-		
FFFFFFFC	+	+	-	-	-	-	-	-	-	-		
FFFFFFFB	-	-	+	-	-	-	-	-	-	-		
FFFFFFFA	+	-	+	-	-	-	-	-	-	-		
FFFFFFF9	-	+	+	-	-	-	-	-	-	-		
FFFFFFF8	+	+	+	-	-	-	-	-	-	-		
FFFFFFF7	-	-	-	+	-	-	-	-	-	-		
FFFFFFF6	+	-	-	+	-	-	-	-	-	-		
FFFFFFF5	-	+	-	+	-	-	-	-	-	-		

Table 4-2: Encoder Options Description

Option Word	Encoder OptionS											
	4:2:2 Profile	TTX	StatMux	Cascading	Basic Encr.	Audio Only	52M	VBI over SDI	QPSK	AC3		
FFFFFFF4	+	+	-	+	-	-	-	-	-	-		
FFFFFFF3	-	-	+	+	-	-	-	-	-	-		
FFFFFFF2	+	-	+	+	-	-	-	-	-	-		
FFFFFFF1	-	+	+	+	-	-	-	-	-	-		
FFFFFFF0	+	+	+	+	-	-	-	-	-	-		
FFFFFFEF	-	-	-	-	+	-	+	-	-	-		
FFFFFFDF	-	-	-	-	-	+	+	-	-	-		
FFFFFFCF	-	-	-	-	+	+	+	-	-	-		
FFFFFFBF	-	-	-	-	-	-	-	-	-	-		
FFFFFFAF	-	-	-	-	+	-	-	-	-	-		
FFFFFF9F	-	-	-	-	-	+	-	-	-	-		
FFFFFF8F	-	-	-	-	+	+	-	-	-	-		
FFFFFF7F	-	-	-	-	-	-	+	+	-	-		
FFFFFF6F	-	-	-	-	+	-	+	+	-	-		
FFFFFF5F	-	-	-	-	-	+	+	+	-	-		
FFFFFF4F	-	-	-	-	+	+	+	+	-	-		
FFFFFF3F	-	-	-	-	-	-	-	+	-	-		
FFFFFF2F	-	-	-	-	+	-	-	+	-	-		
FFFFFF1F	-	-	-	-	-	+	-	+	-	-		
FFFFFF0F	-	-	-	-	+	+	-	+	-	-		
FFFFFEFF	-	-	-	-	-	-	-	-	+	-		
FFFFFDFF	-	-	-	-	-	-	-	-	-	+		
FFFFFCFF	-	-	-	-	-	-	-	-	+	+		

Figure 4-22: Encoder Options Update Sequence - Example

```
Copyright (c) Integrated Systems, Inc., 1992.
Welcome to pSOSystem...

com> x flash show


Magic Number .. : 'E1K0'
IP ............ : 100.100.100.10
GW ............ : 100.100.100.1
MAC ........... : 00-50-C2-01-C8-FD
HW_version .... : 8 (Board:E9) (450908)
Encoder Options : FFFFFF70 FFFFFFFF FFFFFFFF FFFFFFFF
Encoder Options : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
Encoder Options : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
Encoder Options : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
User Options .. : FFFFFFE7 FFFFFFFF FFFFFFFF FFFFFFFF
User Options .. : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
User Options .. : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
User Options .. : FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
Checksum ...... : 28722284
Magic Number .. : 'E1K0'
NetMask ....... : 255.255.255.0 (FFFFFF00)
Checksum ...... : BACEB5E0




com> x flash enc 0 fffffffb 3316427

com> x flash save

Update Done OK

com>
```

4.2.9. Update User Options

The following procedure describes how to update the User Options in the Encoder.

NOTE

Changing the User Options DO NOT requires Scopus permission.

a. If required, prepare the system for file copying according to the following steps:

   1. Make sure proper physical and electrical connection of the Encoder and HyperTerminal is complete and both units are activated (see paragraph 4.2.3 above).
   2. Press "f" to ensure that the terminal is connected (the encoder status is displayed).
   3. Press "Esc" to EXIT. Acknowledge exit by pressing "Y" to the message "are you sure?"
   4. Type "com " in the "login" section and then press **[Enter]** Key.
   5. In "Password" section, press **[Enter]** Key. Check that the shell prompt (>com) is displayed.

b. At the terminal, type "x flash user {user_wordn].{option-code]" and press **[Enter]** Key to update the new encoder options in the encoder shell.

NOTE

{user_word$_n$].is the user word number (00 - 15) to be updated.

{option-code] is the new word containing the activation code for the user option.

c. Type "x flash save" and press **[Enter]** Key to save the new encoder options in the encoder shell. Once the save is completed, the following message is displayed: "Update Done OK" (see Figure 4-23)

Figure 4-23: User Options Update Sequence - Example

```
com> flash user 0 ffffffe7
com> flash save
update done OK
com>
```

4.3. ENCODER CONFIGURATION

In order to determine the parameter settings during the initialization, the Encoder uses the records specified in a configuration file. This file includes documentation regarding the valid records under each setting. Also this file lists and describes the valid records and their function.

The configuration file can be modified in the following ways:

- Using the supplied VI text editor
- Copying the configuration file to a host computer, where the text is edited and then copying back the modified file to the Encoder.

NOTES

Copying the file can be done by using RS-232 connection or the TFTP connection.

The file can be edited using any kind of Word editor, once it is transferred to the editor. It is important to ensure that the file returned to the Encoder is in text format.

CAUTION

IT IS RECOMMENDED THAT AUTHORIZED PERSONNEL ONLY BE REQUESTED TO PERFORM MAINTENANCE PROCEDURES OR MODIFICATIONS TO THE CONFIG FILE. UNAUTHORIZED CHANGES MADE TO THIS FILE MAY CAUSE UNPREDICTABLE RESULTS OR SYSTEM FAILURE

IP numbers follow the "dotted decimal" notations (r.s.t.u) representing four groups of numbers e.g. [10.0.0.20].

4.3.1. Using VI Editor to Edit the Configuration File

VI Editor is a simple UNIX text editor that is installed on the Encoder to enable modification of the Encoders configuration file (encoder.cfg) under ANSI compliant terminal emulation. Any ANSI compliant terminal may be used providing the requirement of 24 logical lines and 80 logical columns.

Suitable terminal applications include (tested):

- Hilgraeve HyperTerminal (installed on most WIN NT/9X OS)
- Teranishi TeraTermPro Ver 2.3

The following procedure assumes that your ANSI compliant terminal is installed and configured for connection to the Encoder.

The VI Editor provides online help.

To access the help file, type `:h<Enter>`. To quit, type `:q<enter>`.

The 'Backspace' key does not work while in VI mode.

The editor converts TABS to spaces when reading an input file. During Insert and Replace modes, TABS are not allowed or accepted. During Insert and Replace modes, Backspace does not erase the last typed character and the user must exit the mode and correct the error in the editing mode, by the x or X keys. The VI Editor provides four basic editor modes, short keys, and functions (described in Table 4-3).

Replacing the last character with '_' saves the original input file.

Table 4-3: VI Editor Modes

MODE	PARAMETERS	DESCRIPTION
Insert	**Identification String:** -Insert Mode- **Activated by:** 'i', 'a', 'o', 'O' **Terminated by**: <ESC>	Used to insert text into file. Means that the command can be duplicated by an integer prefix.
Replace	**Identification String:** Replace Mode **Activated by:** String at bottom Status line **Terminated by:** ---	Replaces / Overstrikes text in file. Means that the command can be duplicated by an integer prefix.
Command	**Identification String:** No special mark on screen **Activated by:** --- **Terminated by:** ---	To move cursor, delete, cut, copy, and paste text. This is the default mode after exiting from other modes.
Meta-Command	**Identification String:** Echo displayed on the bottom status line **Activated by:** '**:**' followed by command character(s) **Terminated by:** ---	Special commands, e.g. write file, quit, get help, etc. **:q** Exit editor/help **:q!** Ignores any changes and Quits editor/help **:w** Writes buffer to file **:w!** Same as ':w' **:wq** Writes buffer to file and exit **:x** Writes buffer to file (ONLY if changed) and exit **:h** Enters help buffer

Table 4-4: VI Commands and Syntax

SYNTAX	DESCRIPTION
/text<CR>	Search text forward in the buffer (limited to 32 characters)
/<CR>	Repeat last search (forward) in the buffer.
Cursor Movement Commands	
[N]j	Down. (Also by '+', <ENTER>)
[N]k	Up (Also by '-')
[N]h	Left (Also by <BackSPACE>)
[N]l	Right (Also by <SPACE>)
Editing Commands	
[N]x	Deletes character(s) under the cursor
[N]X	Deletes character(s) left to the cursor
[N]dd	Deletes N lines starting from the current line (puts them in the paste buffer)
I	Inserts text at the cursor position.
A	Appends text after the cursor position
J	Join next line to current one.
O	Opens a new line below cursor and inserts text.
O	Opens a new line above the current line.
[N]Y	Yanks N lines into a paste buffer (starting at current line).
P	Puts the paste buffer after the cursor position.
P	Puts the paste buffer before the cursor position.
R	Replaces text.

CAUTION

THE PASTE BUFFER IS LIMITED TO 32 LINES AND

TO OPEN THE ENCODER.CFG WITH VI EDITOR:

From the command prompt enter the command: **x vi encoder.cfg.**

The VI editor is executed and the encoder.cfg is displayed.

NOTE

If you have doubts about an item (if it is legal in any former version), follow the next procedure (in an encoder with the old version):

- Create a small file with the questionable item, followed by a line 'EndOfData'. The file can have any name, e.g : z1.z2.

- Copy the file into the E1000 and execute the command: ***x convertc -c z1.z2*** *(This command should end without error messages).*

4.3.2. Encoder Configuration File

The E-1000 series settings are defined in the "encoder.cfg" configuration file. Table 4-5 lists and describes each parameter and the valid options available for the parameter. Table 4-6 lists additional E-1000 conbfiguration parameters that added for specific applications.

Additional optional configuration parameters are provided in the "encoder.cfg" configuration file when the respective option is provided. These options consists of the following:

- Configuration parameters for the ATM Output interface. For details, refer to
- Configuration parameters for the ATM Output interface. For details, refer to Table 4-10.
- Configuration parameters for the SM-3000 and SM-3010 Statistical Multiplexers. For details, refer to Table 4-9.
- Configuration parameters for the CAS-5000 Conditional Access System. For details, refer to Table 4-11.

CAUTION

ONLY AUTHORIZED PERSONNEL MAY DEFINE THE PARAMETERS CONTAINED IN THE CONFIGURATION FILE. ANY CHANGES MADE TO THIS FILE MAY CAUSE UNPREDICTIBLE RESULTS OR SYSTEM FAILURE.

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
VideoResolution	**Valid Options:** • **F720:** Full Vert. Res. 720 Pix/Line Horiz. Res. • **F704:** Full Vert. Res. 704 Pix/Line Horiz. Res. • **F640:** Full Vert. Res. 640 Pix/Line Horiz. Res. • **F544:** Full Vert. Res. 544 Pix/Line Horiz. Res. • **F480:** Full Vert. Res. 480 Pix/Line Horiz. Res. • **F368:** Full Vert. Res. 368 Pix/Line Horiz. Res. ***NOTE:*** *Use of F368 resolution is not recommended.* *For a better picture, use resolution F352.* • **F352:** Full Vert. Res. 352 Pix/Line Horiz. Res. • **H352:** Half Vert. Res. 352 Pix/Line Horiz. Res. • **AUTO:** Auto Resolution
OutputRate	Output rate of the transport stream. **Valid Options:** integer in the range of 500000 - 52000000 (0.5 to 52 Mbps)
VideoFormat	Determines the type of Video Format. **Valid Options: NTSC** or **PAL**
VideoSource	Determines the type of Video Interface. **Valid Options: COMPOSITE**, **SVHS**, **COMPONENT** or **D1_SDI**
VideoTest	Determines Video Test Pattern Source. **Valid Options:** • **1** = internal video test pattern • **0** = external video is used
AudioTest	Determines Audio Test Pattern Source. **Valid Options:** • **1** = internal audio test pattern • **0** = external audio is used

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
VideoPID	Video PID number
AudioPID_1	1'st Audio PID number
AudioPID_2	2'nd Audio PID number
AuxDataPID	Low Speed Data PID number (RS-232)
HSD_PID	High Speed Data PID number (RS-422)
Teletext_PID	Teletext PID number
PcrPID	PCR parameter for Transport stream type
PmrPID	PMR parameter for Transport stream type
AudioPID_3	3'rd Audio PID number
AudioPID_4	4'th Audio PID number ***NOTES:*** *Number Range: in HEX; 0x20 - 0x1FFF* *PCR set to 0 means that it "follows" the value of the VideoPID.*
ChannelClockType	Determines software control of output clock channel source. **Valid Options:** • **Internal:** obtained internally. • **External:** external source
AudioSource_1	Determines the type of Audio Interface. **Valid Options:** **AES-EBU, ANALOG, EMBEDDED, AUTO, DOLBY, LINEAR** ***NOTES:*** *When in AUTO Mode, it automatically detects the Audio Interface and sets the interface to follow the video interface, as follows:* *For VideoIntreface = Analog (YC, YUV, CV), audio source is ANALOG* *For VideoIntreface==Digital (SDI), audio source is AES-EBU* DOLBY Mode can be specified only for AudioSource_1.
AudioSource_2	
AudioSource_3	
AudioSource_4	

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
AudioRate_1 ***AudioRate_2*** ***AudioRate_3*** ***AudioRate_4***	Fixes the coded audio bit rate. **Valid Options:** 0, 64000, 96000, 128000, 160000, 192000, 224000, 256000, 320000, or 384000. ***NOTE:*** *When N = 0 then this channel is not active.*
AudioSampleRate	Determines the audio sample rate. **Valid Options: 48** for 48K, **32** for 32K, or **44** for 44.1K
HSDataRate	The estimated rate of the High Speed Data channel. **Valid Options:** Maximum value is 20 MBps.
LS_DataRate	Fixes the low speed port data rate. **Valid Options:** 0, 2400, 4800, 9600, 19200, 38400, 57600, 115200
16:9_AspectRatio	Determines the Aspect Ratio of the encoded video. **Valid Options:** **1** = Sets the aspects ratio to 4:3 **2** = Sets the aspects ratio to 16:9 **3** = Sets the aspects ratio to 4:3 at start-up and changes with the WSS. **4** = Sets the aspects ratio to 16:9 at start-up and changes with the WSS. ***NOTE:*** *For options 3 (4:3) and 4(16:9), the value follows the WSS data; if WSS changes, the value in this item follows the WSS value.*
HSClockRate	Displays the current value and enables the selection of the internal clock source that can be used by the customer to control the High Speed data input. **Valid Options:** 64K, 512K, 1024K, 2048K, 3072K, 4096K, 6144K, or 8192K
ForcedVidRate	A long number that forces video rates to the specified rate when the computed value is higher than this value. **Valid Options:** range of 1000000 to 50000000

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
AudioMode_1 ***AudioMode_2*** ***AudioMode_3*** ***AudioMode_4***	Fixes the coding mode of the audio channels. **Valid Options:** **Stereo** (default), **JointStereo**, **DualChannel**, or **SingleChannel**
RecoverErrors	Controls automatic recovery when PTS FIFO, output FIFO or measured video bit rate is out of expected range. **Valid Options: 0** = Disabled, **1** = Enabled
Verbosity	Causes the Encoder to report many events to the monitor port. These events include all faults detected during encoding and more. **Valid Options: 0** = Disabled, **1** = Enabled
StatInterval	Encoder status is written to monitor each N second. **Valid Options:** 0 = Disabled, **N** = Value in seconds ***NOTE:*** *If Verbosity = 0, any value for N except 0 is meaningless.*
StandardA2D	Determine the type of Standard Analog-to-Digital. **Valid Options:** **0** = 10B **1** = H **2** = I ***CAUTION:*** *DO NOT CHANGE THIS VALUE.*
VideoProfile	Determines the Video Profile. **Valid Options:** **0** for 4:2:0 Video Profile **1** for 4:2:0 Video Profile with Low Delay **2** for 4:2:2 Video Profile **3** for 4:2:2 Video Profile with Low Delay **4** for 4:2:2 Video Profile with Ultra-Low Delay

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
NMS_Control	Defines the NMS control. **Valid Options:** **1** = NMS control is enabled. If connection with an NMS is established, the Front Panel displays only the encoder status and the "change_THIS_state" message. **2** = NMS control is disabled and the Front Panel has full control over the system. **3** = Serial NMS control is enabled. The Front Panel displays the "change_THIS_state" message
UDP_sm_X_Port ***UDP_sm_R_Port***	The port numbers used for the communication with the STAT-MUX controller (Transmit port (X_Port) and Recieve port (R_Port), respectively) **Valid Range:** 1024 to 6400
StatMuxMode	Defines the Statistical Multiplexer operational status. **Valid Options: 0** = OFF, **1** = ON
VideoTestType	Displays the current value and enables the selection of type of the Video test bar injected **Valid Options: 0** = bar test, **1** = flicker bar test.
ServiceName	Defines the Service Provider name. Example: "SCOPUS". Any string of maximum 22 characters (A-Z capitals, digits, space and '-' only). Spaces in the string should be enclosed it in quotation marks, i.e. "AN EXAMPLE".
LuminanceLevel	Defines the Luminance level. **Valid Options:** any number between 0 - 255 [neutral value = 128]
ChrominanceLevel	Defines the Chrominance level. **Valid Options:** any number between 0 - 255 [neutral value = 128]
VideoOffsetLevel	Defines the Video Offset level. **Valid Options:** any number between 0 - 255 [neutral value = 128]
Y_C_Delay	Defines the Y_C delay. **Valid Options:** Any number between 0 - 12 [neutral value = 6]
DigitNoiseReduct	Determines the Noise reduction level. **Valid Options:** Off, Low, Medium, High

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
VideoPhase	Defines the Video phase. **Valid Options:** any number between 0 - 20 [Neutral value = 10]
ChromaPhase	Defines the Chroma phase. **Valid Options:** Any number between 0 - 255 [Neutral value = 128]
DVB_Tabl_Present	Defines how to use the DVB tables. **Valid Options:** **0** = liminates the DVB tables (for improved video quality at very low rates) **1** = Normal **2** = Plays the content of the (binary) file DVB.TBL
PacketSize	Defines the size of the packet for the G.703 Output format. **Valid Options:** **0** = 188 or **1** = 204 (for G703)
CAS_method	Defines the CAS system used. **Valid Options:** **0** = Clear **1** = Encoder based encryption **2** = Not Applicable **3** = CAS-5000 based encryption (DVB Scrambling) **4** = EBU BISS Scrambling
CAS_group_no	Group number for the Encoder based encryption method. **Valid Options:** Group Number (0-15).
LocalIdleTime	The idle time of the FRONT PANEL, after which the encoder returns to NMS enable mode. Expresses in seconds. When set to **0,** this feature is disabled.
KeepAliveTimer	This is a timeout (in seconds) in which the TCP connections are reset to the initial state (wait for NMS connection) if no messages are received from the NMS station. When set to **0,** this feature is disabled.
CBROutputRate ***CBRVideoRate***	The last values that were used during Constant Bit Rate mode are kept here for restoring them upon exit from the Stat-Mux Mode.

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
ProgramNumber	Program number in PMT or the Service ID in SDT of the current encoder. **Valid Options:** Hexadecimal numbers between 1 and FFFF ***CAUTION:*** *Encoder based encryption works only if the ProgramNumber = 1 !*
Alarms_Relay	The argument is a string that must be composed from the character set "AVUTMN". The meaning of each character/operator is: **V** = Turn on relay if **V**ideo fault exists. **U** = Turn on relay if a**U**dio fault exists. **T** = Turn on relay if **T**emperature fault exists. **M** = Turn on relay if Mux module reports any fault **D** = Turn on relay if mo**D**ulator reports any fault (Applicable for E-1500 only) The above characters can be concatenated to form an OR function (Boolean) for all conditions specified. **A** = Turns ON all individual conditions. **N** = Turn sOFF all individual conditions. ***NOTE:*** *The results are unpredictable if conflicting conditions are specified.* **Correct Example: 'Alarms_Relay TV'** Turns on relay if temperature or video faults exist. **Incorrect Example: 'Alarms_Relay TVN'** May not turn on relay if temperature or video faults exist because of the N operator.
EncodersCascading	Defines the type of encoder connection **Valid Options:** **0** = regular encoder **1** = encoder which receives another encoder transport stream through the HighSpeedData FIFO

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
DVB_options	32 bit HEX number that controls the output DVB stream. Default: 2 ***CAUTION:*** *To be changed only by Scopus Networks Technologies qualified staff.*
GOP_Structure	Controls the GOP structure and attributes. **Valid Options:** • **IP** keyword**:** Generates IPPP.. PPP.. GOPs. Results in low delay, low efficiency (bit rate wise) encoder. • **IBP** keyword**:** Generates IBPBP..IBPBP.. GOPs. Results in medium delay, medium efficiency encoder. • **IBBP** keyword**:** Generates IBBP..IBBP.. GOPs. Results in high delay, high efficiency (bit rate wise) encoder.
GOPMN	Left BYTE is M value, right BYTE is N value (values are in Hexadecimal notation). ***NOTES:*** *Overrides the GOP_Structure item if specified.* *N must be dividable by M.* *Example: M=2,N=12 specified as : 20C*
TrnspStrmID ***OrgnlNtwrkID***	Transport Stream ID and Original Network ID, respectively. **Number Range:** HEX number 0x20 - 0x1FF (as for all PIDs)
AV_Sync	Defines the amount of audio shift (for A/V fine tuning). Given in positive or negative units of mSec (Positive = delay the audio)
Dolby_Sync	Defines the amount of audio shift (for A/V fine tuning) when DOLBY-pass-though is selected for audio ch#0. Given in positive or negative units of mSec (Positive = delay the audio)

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
Dolby_Rate	This item applies when DOLBY pass though is selected for audio ch#0. This is the estimated rate of the DOLBY source. The range is between 32000-640000 bps. • If the user puts a value bigger than the real value, a waste of bandwidth occurs. • If he puts a value smaller than the real value, the audio output will be incorrect. The normal CH#0 rate has no meaning in this state.
NTSC_Setup	Enables the NTSC Setup Level. Meaningful for the Harris and for the 10Bits A/Ds. **Valid Options:** **0** disables the NTSC setup level **1** enables the NTSC setup level (default).
AudioVolume_1 ***AudioVolume_2*** ***AudioVolume_3*** ***AudioVolume_4***	Sets the volume of each Audio Channel (expressed in dB). If not specified, it has the default value of 0. **Valid Options:** Can be any integer in the range -12 to +12
Language_1 ***Language_2*** ***Language_3*** ***Language_4***	Specifies the language code for each audio channel. **Valid Options:** **0** = if no specification is available, or **3 characters** = language code, according to ISO 639-2 standard.
IntgrtdADmode	Determines the mode of the new Integrated Video **Valid Options:** **"tv", "vcr", "dvd"** Interfaces
VBI_over_CV	Enables VBI information input from the digital input of the SDI Video Interface option. **Valid Options:** **0** = Default **1** = Uses VBI information received on the Composite Video (CV) input.

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
VBI-Fields	The argument is a string that must be composed from the character set "ANTWSV". The meaning of each character is as follows: **A** = ALL VBI components are enabled. **N** = ALL VBI components are disbled. **T** = Telelext is enabled. **W** = WSS is enabled (Aspect Ratio Selection) **S** = SMC is enabled (Sound Mode) **V** = VPS is enabled. The above characters can be concatenated to form an OR of all conditions specified. The results are unpredictable if conflicting conditions are specified (such as 'NVT'). ***CAUTION:*** *VPS is disabled unless TTX is enabled too.*
LumaFilter ***ChromaFilter***	Temporal filters for the vertical luminance blurring and for the chrominance vertical decimation features of the picture vertical information. **Valid Options: 0** = filter not activated (default), **1** = filter activated.
LumaVertFilter	Sets the Luminance Vertical Filter strength. This filter blurs the picture vertically, each level removing about 10% of the information. Therefore, the strongest filter (7) removes about 70% of the information. **Valid Options: 0** = Bypass**, 1, 2, 3, 4, 5, 6 and 7** = Strongest
ChromaDecFilter	Sets the Chrominance Decimation Filter strength. This is an additional filtering on the Chrominance vertical decimation process (the decimation for obtaining the 4:2:0 picture). **Valid Options: 0** = Bypass, **1, 2** and **3** = Strongest
HorizontalFilter	Sets the Horizontal Filter strength. This filter blurs the picture horizontally, each level removing about 5% of the information. Therefore, the strongest filter (7) removes about 35% of the information. **Valid Options: 0** = Bypass**, 1, 2, 3, 4, 5, 6** and **7** = Strongest

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
IntraRefreshRate	Defines the Intra DCT refresh rate when in Low Delay mode. **Valid Options:** **0** = Disable refresh **1** = Slow refresh rate **2** = Moderate refresh rate **3** = Fast refresh rate **4** = Total refresh rate
DLBEnData_Rate0 ***DLBEnData_Rate1***	Defines the data rate for the Dolby Digital audio encoder. **Valid Options:** a number between 3 and 18, representing: **3=**56K**, 4=**64K**, 6**=96K**, 7**=112K**, 8**=128K**, 9**=160K**, 10**=192K**, 11**=224K**, 12**=256K**, 13**=320K**, 14**=384K**, 14**=448K**, 16**=512K**, 17**=576K**, 18**=640K
DLBEnCodinMode0 ***DLBEnCodinMode1***	Defines the operating mode of the Dolby Digital audio encoder. **Valid Options:** a number between 0 and 2, representing: **0=** Disabled, **1**= Mono, **2**= Stereo
DLBEnSampleRate0 ***DLBEnSampleRate1***	Defines the sampling frequency of the Dolby Digital audio encoder. **Valid Options:** a number between 0 and 2, representing: **0=** 48K, **1**= 44.1K, **2**= 32K
DLBEnStreamMode0 ***DLBEnStreamMode1***	Defines the Bitstream operating mode of the Dolby Digital audio encoder. **Valid Options:** a number between 0 and 7, representing: **0 =** Complete_Main **1** = Musin_n_Effects **2** = Visually_Inpaired **3** = Hearing_impaired **4** = Dialogue **5** = Commentary **6** = Emergency **7** = Voiceover
DLBEnDialogue0 ***DLBEnDialogue1***	Defines the normalization value for Dialogue Mode of the Dolby Digital audio encoder. **Valid Options:** a number between 1 and 31.

Table 4-5: Encoder Basic Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
DLBEnSrnd_Mode0 ***DLBEnSrnd_Mode1***	Defines the surround mode of the Dolby Digital audio encoder. **Valid Options:** a number between 0 and 2, representing: **0=** Not_Indicated, **1**= Not_Surround_Coded, **2**= Surround_Coded
DLBEnMix_Level0 ***DLBEnMix_Level1***	Defines the mixing level for the Dolby Digital audio encoder. **Valid Options:** a number between 0 and 31.
DLBEnRoom_Type0 ***DLBEnRoom_Type1***	Defines the room type for the Dolby Digital audio encoder. **Valid Options:** a number between 0 and and 2, representing: **0=** Not_Indicated, **1**= Large_Room, **2**= Small_Room
DLBEnCopyright0 ***DLBEnCopyright1***	Enables/disables the Dolby Digital audio encoder copyright bit. **Valid Options: 0** or **1**.
DLBEnOriginal0 ***DLBEnOriginal1***	Enables/disables the Dolby Digital original bitstream. **Valid Options: 0** or **1**.
DLBEnDrcProfile0 ***DLBEnDrcProfile1***	Defines the dynamic range of the compression profile for the Dolby Digital audio encoder. **Valid Options:** a number between 0 and and 5, representing: **0=** None, **1**= Film standard, **2**= Film light, **3**= music standard, **4** = Music light, **5** = Speech
DLBEnRF_Om_Prtc0 ***DLBEnRF_Om_Prtc1***	Enables/disables the RF overmodulation protection for the Dolby Digital audio encoder. **Valid Options: 0** or **1**.
DLBEnLP_Filter0 ***DLBEnLP_Filter1***	Enables/disables the LP bandwidth filter for the Dolby Digital audio encoder. **Valid Options: 0** or **1**.
DLBEnDC_Filter0 ***DLBEnDC_Filter1***	Enables/disables the DC notch filter for the Dolby Digital audio encoder. **Valid Options: 0** or **1**.

Table 4-6: Encoder Specific features Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
VBV_Delay	Overrides default value if other than 0
Pnl_DeviceName	Self determined Device Name. This string will be displayed instead of the "E1X00 DVB Encoder" normally displayed message. Any string of maximum 22 characters (A-Z capitals, space and '-' only). Spaces in the string should be enclosed it in quotation marks, i.e. "AN EXAMPLE".
Pnl_CompanyName	Self determined Company Name. This string will be displayed instead of the "SCOPUS" normally displayed message. Any string of maximum 22 characters (A-Z capitals, space and '-' only). Spaces in the string should be enclosed it in quotation marks, i.e. "AN EXAMPLE".
ProviderName	The Provider Name. Any string of maximum 22 characters (A-Z capitals, space and '-' only). Spaces in the string should be enclosed it in quotation marks, i.e. "AN EXAMPLE".
NetworkID	Network identification number, represented in Hexadecimal
NetworkName	The Network name. A string of a maximum 19 characters. (A-Z capitals, space and '-' only). Spaces in the string should be enclosed it in quotation marks, i.e. "AN EXAMPLE".
VideoAbsentFilter	Sets the VIDEO_ABSENT condition response time when sending this condition to the NMS. Options are: **0** = fastest response **1** = fast response **2** = medium response **3** = slow response (default)

Table 4-6: Encoder Specific features Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
SelectiveScrambl	The argument is a string that must be composed from the character set "ANV1234". The meaning of each character is: **A** = Scrambling all components **N** = Scrambling no components **V** = Scrambling video component **D** = Scrambling data component **1,2,3,4** = Scrambling Audio1, Audio2, Audio3 or Audio4 component The above characters can be concatenated to form an OR of all conditions specified. The results are unpredictable if conflicting conditions are specified (such as 'NV2').
Service2Name **Service3Name** **Service4Name**	***NOTE:*** *This option is available in AUDIO ONLY mode.* These are 3 strings of audio service names of channels 2,3,4. Each string is limited to 11 characters. If values are not specified, the default values are: **"RADIO2", "RADIO3", "RADIO4".**
Audio_PMT_PIDS	***NOTE:*** *This option is available in AUDIO ONLY mode.* This is a string of 3 audio PMT PID's. It should be 3 HEX numbers separated by colons only. If values are not specified, the default values are: **10A9, 10D9, 1109**.
Aud_Program_nmbr	***NOTE:*** *This option is available in AUDIO ONLY mode.* This is a string of 3 audio program numbers. It should be 3 HEX numbers separated by colons only. If values are not specified, the default values are: **2, 3, 4**.

Table 4-6: Encoder Specific features Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
AudioVolume_1R **AudioVolume_2R** **AudioVolume_3R** **AudioVolume_4R**	Sets the volume of the Audio Channel (expressed in DB) for the upper 4 channels, when working with 8 mono channels. **Valid Values:** an integer in the range -12 to +12 (default value = 0).
AudioPID_1R **AudioPID_2R** **AudioPID_3R** **AudioPID_4R**	Defines the PID for the upper 4 channels when working with 8 mono channels.
AudioRate_1R **AudioRate_2R** **AudioRate_3R** **AudioRate_4R**	Sets the coded audio bit rate for the upper 4 channels, when working with 8 mono channels. **Valid Options**: **0, 64000, 96000, 128000, 160000, 192000** **0** means that this channel is not active.
Language_1R **Language_2R** **Language_3R** **Language_4R**	Specifies the language code for the upper 4 channels, when working with 8 mono channels. **Valid Options:** **0** = if no specification is available, or **3 characters** = language code, according to ISO 639-2 standard.
PCR_pid_eq_APID	When in Radio mode, enables the PCR PID to equal the Audio PID. Valid values: **0** = disabled (default), **1** = enabled
SDI_ANLG-swch	Enables the automatic switching between COMPOSITE and SDI video inputs for the Composite/SDI Video Input Panel. Detection of the presence of video at the inputs controls this automatic switch. **Valid Options:** **0** = enables automatic switching (default). **N** (>0) Sets switching delay to N seconds. ***CAUTION:*** *The SDI_ANLG-swch parameter is disabled when the bit 11 of the* DVB_*options parameter is set.*

Table 4-6: Encoder Specific features Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
CC_method	Sets the operating mode of the Close-Caption (CC) feature. **Valid Options** [format: decimal representation of a 3 digit binaric word, each bit represents a method]: **1** [001] = Least significant Bit (D0), enables the CC through user-data (default). **2** [010] = Next Bit (D1), enables the CC through DVB packets. **4** [100] = Third Bit (D2), enables the CC through ATSC packets. ***NOTES:*** *User-data and ATSC methods must be exclusive. If both of them are specified, ATSC overrides user-data.* *Some combinations are possible (a single bit in the specified decimal number enables each method):* *3 [011] = enables sending CC using both user data and DVB* *6 [110] = enables sending CC using ATSC and DVB* **Example:** To send CC as DVB and as ATSC, specify "CC_method 6"
ExtendedVid.Lines	***NOTE:*** *This parameter is applicable for 4:2:2 profile only.* Enables coding of the extended video lines (invisible lines). **Valid Options: 1** = enables, **0** = disables coding
AP_duration_4_RA	This parameter sets the time delay between re-connection of video signal and the reset of the audio encoder. This feature is required when the "DVB-options" parameter is set to 8. i.e., any "video present" after a "video absent" causes an audio reset by the MUX. **Valid Values:** in seconds, up to 18 seconds
DV-SUB-rate	DVB subtitling rate. **Valid Range:** Between 0 to 2000000

Table 4-6: Encoder Specific features Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
DV-SUB-lang **DV-SUB-lang1**	Sets the subtitling language for the Main and Secondary DVB subtitling language, respectively. **Valid Options:** **0** = if no specification is available, or **3 characters** = language code, according to ISO 639-2 standard.
DV-SUB-pages **DV-SUB-pages1**	Sets the identification code for the Main and Secondary language pages, respectively. Expressed as hexadecimal number: • Left half (word): Composition Page ID • Right half (word): Ancillary Page ID
TSBT-LNG-init **TSBT-NMR-init** **TSBT-LNG-0** **TSBT-NMR-0** **TSBT-LNG-1** **TSBT-NMR-1** **TSBT-LNG-2** **TSBT-NMR-2** **TSBT-LNG-3** **TSBT-NMR-3** **TSBT-LNG-add_info** **TSBT-NMR-add_info** **TSBT-LNG-prog_scd** **TSBT-NMR-prog_scd**	Seven pairs of language/page-number parameters. The language is the language code for each TTX page. **Valid options:** **0:** No specification is available. **nnn:** A three characters language code, according to ISO 639-2 standard. The number is any number between 100 and 900. ***NOTE:*** *Pairs which end with -init are attributes of the init page (normally 100).* *Pairs which end with add_info are attributes of the additional information page of the teletext.* *Pairs which end with -prog_scd are attributes of the program schedule page of the teletext.* Any item will be active given that the language description has a non-zero value.
LSD-TimeOut	Activates the TIME-OUT mode of the Low Speed Data port. **Valid Options** **0** = This mode is non-active. **Any other number** = This is the timeout value in 0.01 Sec steps. The timeout range is 3-32000 (0.03-320 Seconds) This mode flushes out any pending data if there is a timeout in the input characters stream that is longer then the value specified here.

Table 4-6: Encoder Specific features Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
LSD-TimeOut (Cont'd)	**Important:** 1. This mode requires that the IRD will be set to: DATA2-LSD PID filtering=TRANSPORT PAYLOAD 2. The Encoder sets an additional bandwidth to the LS data allocated bandwidth. (reducing the BW allocated for video). This additional BW is calculated as [150/TimeOut( )TimeOut expressed at 0.01 Sec units, Additional BW expressed at Kbits/second]. ***CAUTION:*** Be careful when setting this item to a low value (the additional BW is 50Kbit/sec at LSD-TimeOut=3).
LSD-EOF-Char	Activates the EOF mode of the LS data port. If the value is higher than 255, this mode is disabled. Any value lowers than 255 enables this mode. The value is the decimal ASCII value of the EOF character. **Valid Options:** 0 thru 255 **Example:** to specify Control-D, use the value 4 This mode flushes out any pending data if the EOF character is detected at the input stream. **Important:** 1. This mode requires that the IRD will be set to: DATA2-LSD PID filtering=TRANSPORT PAYLOAD 2. The Encoder sets an additional bandwidth to the data with a default value of 100 mSec (reducing the BW allocated for video). This additional BW is calculated as [150/TimeOut( )TimeOut expressed at 0.01 Sec units, additional BW expressed at Kbits/second]. 3. If the LSD-Timeout is not 0, it is taken as the timeout for extra BW calculations.
PPCR_interval	Determines the PCR interval in mSec. **Valid Range:** 2 - 100

Table 4-6: Encoder Specific features Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
StreamType	Defines the type of transport stream. **Available Options:** **Transport:**MPEG-2 Transport **Program:**MPEG-2 Program **System:**MPEG-1 System
AudioOrder	A string of 4 digits separated by '-' sign, which indicates how the audio channels are ordered within the PMT. In case of 8 Mono, the order is of mono pairs.
Predictor-Rate	***NOTE:*** *This parameter is provided for the E-1200 encoder only* Sets the predictor to work at SBVR. If all values are zero, the predictor operates in PWCBR mode. **Valid Options: Initial Rate, QI, QP, QB**
CH0-as-DTMF	Activates/deactivates audio channel #0 as a DTMF detector instead of regular audio channel. **Valid Options** **0** = Channel #0 is audio. **1** = Channel #0 is DTMF detector

Table 4-7: E-1200 Look Ahead Specific Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
LA_time_msec	Look Ahead delay, expressed in mSec.
Vid_PTS_Add	Time addition for video presentation, expressed in 90 KHz units.

Table 4-8: Old TCP Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
UDP_PortNumber	NMS Broadcast port, expressed as a decimal number. ***NOTE:*** *This number must match the value specified in the NMS*
ReTransmitTime	Retransmission time between boot messages, expressed in sec.

Table 4-9: Encoder-StatMux Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
UDP_sm_Mcast_IP	Multicast IP address for the StatMux messages. Default: 224.0.0.5 **Valid Range:** 224.0.0.1 - 239.255.255.254
QuantStepI **QuantStepP** **QuantStepB**	Quantization step for I, P, B pictures, respectively. **Valid Options:** **0** = Step disabled (default) **1** through **32** = overwrites the encoder working mode and sets it in a Storage VBR Mode.
Initial-SM-rate	The encoder expects to receive from the StatMux Controller the maximum value for the video rate. The value set in this parameter is used as default rate until a new value is received from the StatMux Controller

Table 4-10: Encoder-ATM-Output Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
ATM_VCI_Adr **ATM_VPI_Adr**	Sets the ATM VCI and VPI addresses. **Valid Values:** **VCI Address range:** 0001 to 0xFF, Hexadecimal **VPI Address range:** 0x20 to 0xFFFF, Hexadecimal
ATM_FEC	Activates (**1** options) or Deactivates (**0** option) the FEC for the ATM Output.

Table 4-11: CAS-5000 Configuration Parameters

PARAMETER	DESCRIPTION AND VALID OPTIONS
CAS_port	TCP port number for the CODICO® CAS-5000 connection.
CAS_IP_number	IP number pf the CAS server.

4.4. DVB SCRAMBLING

Through the addition of a DVB scrambling board, the E-1000 Series Encoders are able to support Fixed-key DVB scrambling over the ASI 3 and two BNC Outputs. The ability to support DVB scrambling ensures interoperability with DVB-CI compatible IRDs (including the CODICO® IRD-2600/2800) and set-top boxes from third party vendors.

This option is available pre-installed at the factory or as hardware installed by one of the Scopus Network Technologies field technicians. DVB scrambling is enabled or disabled on the software level and will only function when the presence of a DVB scrambling board is detected.

When performing a field installation, parameters relating to DVB scrambling must be added to the Encoder Configuration File.

IMPORTANT

WHEN ADDING THESE PARAMETERS, SET THE DVBBOARDEXISTS PARAMETER TO 1.

4.4.1. DVB Scrambling Format

The E-1000 Series of MPEG-2 Professional Encoders support the following DVB Scrambling based schemes for stand-alone receivers. Management of receivers in groups requires the addition of a conditional access system (such as the CAS-5000).

4.4.1.1. Fixed-Key DVB Scrambling

While utilization of DVB scrambling enables greater flexibility to change keys on both transmitting and receiving ends, management functionality is limited to either being ON or OFF.

4.4.1.2. BISS Scrambling System

The European Broadcasting Union (EBU) has defined a simple, standardized scrambling system suitable for Digital Satellite News Gathering (DSNG) that can work with all brands and types of equipment used to transmit and receive television pictures by satellite.

The Basic Interoperable Scrambling System (BISS) is based on the DVB common scrambling algorithm and enables secure (scrambled) transmissions between DSNG equipment from any supplier.

4.4.1.3. BISS-E Scrambling System

The BISS-E specification enables the use of keys or "Session Words" which are also encrypted. This adds another layer of security to the transmissions while fully retaining the benefits of inter-operability.

The advance is achieved solely by means of software and all existing BISS equipment remains compatible with the new BISS-E specification.

The keys for unscrambling the transmission are distributed in a secure form using the established DES encryption method. Descrambling requires the corresponding DES process and a secret identifier buried in the equipment by the Network Manager.

4.4.2. DVB Scrambling Memory Structure

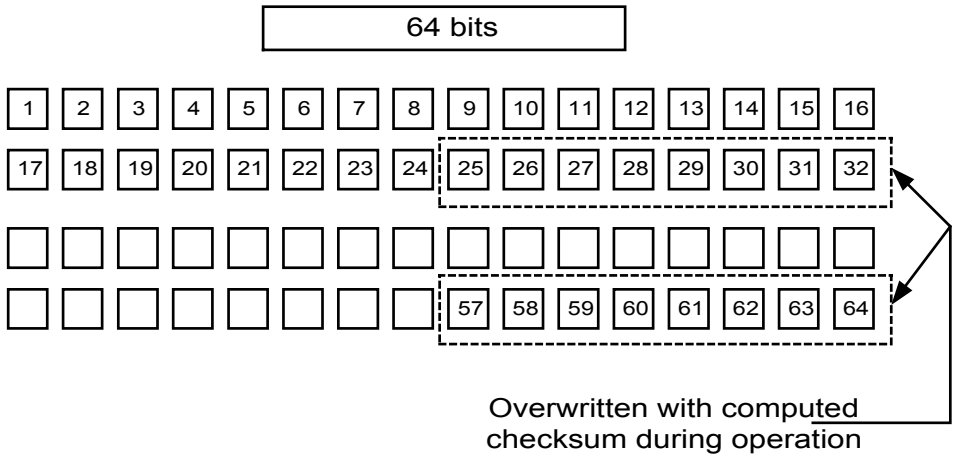
The DVB Scrambling Session Word is a 64 bits word, arranged in two halves of 32 bits each (four bytes). The lower (least significant) byte of each half, accessible to user programming, must not be used as they are overwritten with the computed checksum during operation (see Figure 4-24).

Once saved, the computed results are visible from the DVB scrambling key options. The two halves of each key are separated by hyphens (-), but this occurs only for user readability and it is not part of the keys.

When DVB scrambling is enabled (single key or double key), reception on an IRD is only possible providing that:

- The IRD is fitted for DVB Descrambling.
- The IRD is configured with the proper keys.

Figure 4-24: Memory Structure of Keys



4.4.3. DVB Scrambler Configuration Parameters

The E-1000 Series Encoders configuration files provide access to parameters, which control the DVB scrambler.

describes the parameters of the DVB Scrambling function in the Encoder configuration file.

CAUTION

ONLY AUTHORIZED PERSONNEL MAY DEFINE THE PARAMETERS CONTAINED IN THE CONFIG FILE. ANY CHANGES MADE TO THIS FILE MAY CAUSE UNPREDICTABLE RESULTS OR SYSTEM FAILURE

Table 4-12: DVB Scrambler Configuration Parameters

Parameter	Description
DVBboardExists	Example: 1
DVBscrambleMode	Example: 0 Options: 0 = Clear 1 = BISS-mode-1, (Clear SW panel entry) 2 = BISS-E with Injected ID as active ID 3 = BISS-E with Buried ID as active ID
This is the injected ID of this unit.	
DVBInjcIDHi DVBInjcIDLo	0 0
This is the CLEAR key.	
DVBclrKeyHi DVBclrKeyLo	Example: CDEF1200 Example: 56789000
This is the Crypted Key.	
DVBcrpKeyHi DVBcrpKeyLo	Example: 0 Example: 0
DVBslave1PIDs DVBslave2PIDs	1162;1163;1165;1169 1262;1263;1265;1269 A list of PIDs that comes from the slave(s) and must be scrambled. Each list is limited to 10 items! The list must be semi-colon (;) separated and at HEXA notation (without 0x prefix). DO not insert spaces into the list!

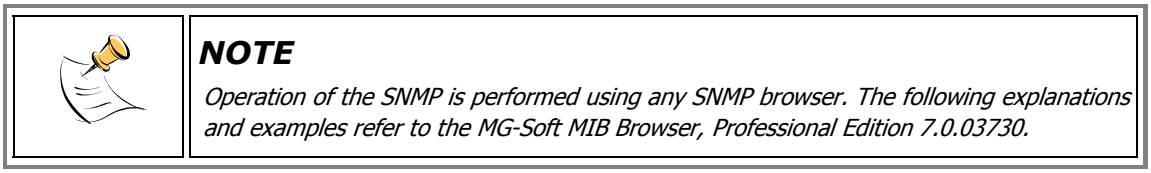
4.5. SNMP MANAGEMENT

SNMP (Simple Network Management Protocol) provides basic network monitoring and management functions between a control station and managed nodes. It uses applications located on the nodes, called agents.

These agents maintain a database of information (Management Information Base or MIB) about the managed nodes and when queried by the manager, retrieve data from the database and send it back to the manager in a response.

In addition, the agent generates a wide range of event reports, called TRAPS.

The SNMP uses UDP packets as its transport over TCP/IP for these queries and responses.



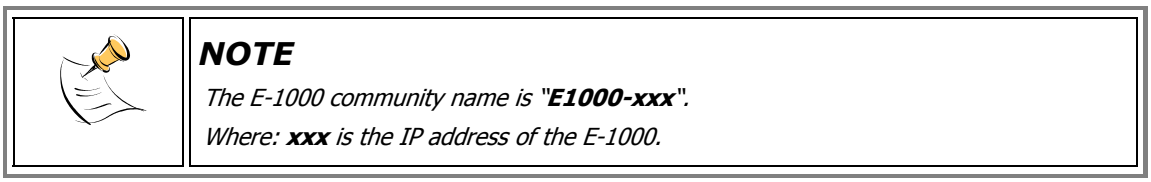
NOTE

Operation of the SNMP is performed using any SNMP browser. The following explanations and examples refer to the MG-Soft MIB Browser, Professional Edition 7.0.03730.

4.5.1. SNMP Configuration

To configure the SNMP browser, the following two parameters should be set:

- **IP:** The IP address of the E-1000.
- **Community Name:** The SNMP Protocol defines a Community Name protocol that should be identical on the E-1000 and on the browser computer.



NOTE

*The E-1000 community name is "**E1000-xxx**".*

*Where: **xxx** is the IP address of the E-1000.*

4.5.2. SNMP Management Information Bases (MIBs)

The E-1000 SNMP supports two management information bases:

- **MIB2 System Table:** contains general parameters that must be supported on any SNMP protocol.
- **E-1000 Private MIB:** contains parameters unique to the E-1000 Encoder. Table 4-13 describes some of the parameters defined in the E-1000 private MIB.

Table 4-13: E-1000 Private MIB Table Description

PARAMETER NAME	DESCRIPTION
scopusE1000	Main directory of Encoder parameters.
→about	Contains common information about functioning SNMP Agent.
→→UserControlAction	This parameter applies the changes made to the encoder parameters. After changing the encoder parameters, this parameter should be set to 4 (apply all settings). **IMPORTANT:** *Changes in the encoder do not take affect until the UserControlAction is set to 4.*
→e1000	Contains encoder parameters
→ftp	Contains data that is necessary to ftp actions
→auxiliary	Auxiliary data. All data under this node is used ONLY for creating traps. ***NOTE:*** *The user should not use GetRequest and WalkRequest for these items.*

4.5.3. SNMP Parameter Property Sheet

Each SNMP parameter has a property sheet, which describes the parameter structure. Figure 4-25 and Figure 4-26 show the property sheet of two parameters.

The structure of the property sheet includes the following sections:

a. Parameter ID: includes information on the parameter name, path, OID, type and module.

b. Parameter Place: shows the parameter parent, siblings and children.

c. Parameter Value: shows the following information:

1. **Value type:** there are three primary types:
   - Integers - for numerical values
   - Strings - for text values
   - Sequence - this parameter is used as an array for another parameter. Arrays are used when there can be a variety of numbers.
2. **Max Access:** describes whether the parameter can be read, written or both. Some parameters can only be read.

d. Parameter Description: A text, which describes the parameter purpose.

Figure 4-25: Encoder Parameter Property Sheet - Example 1

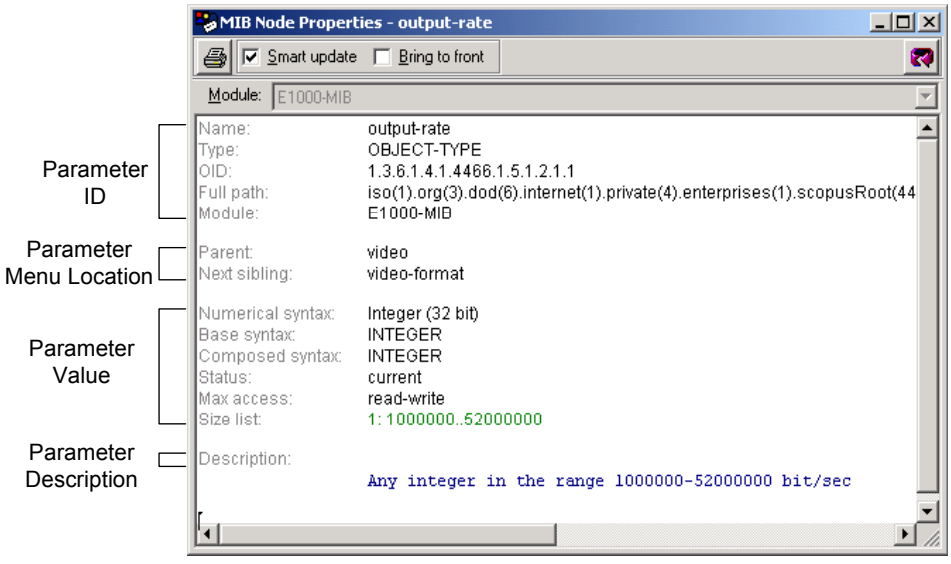
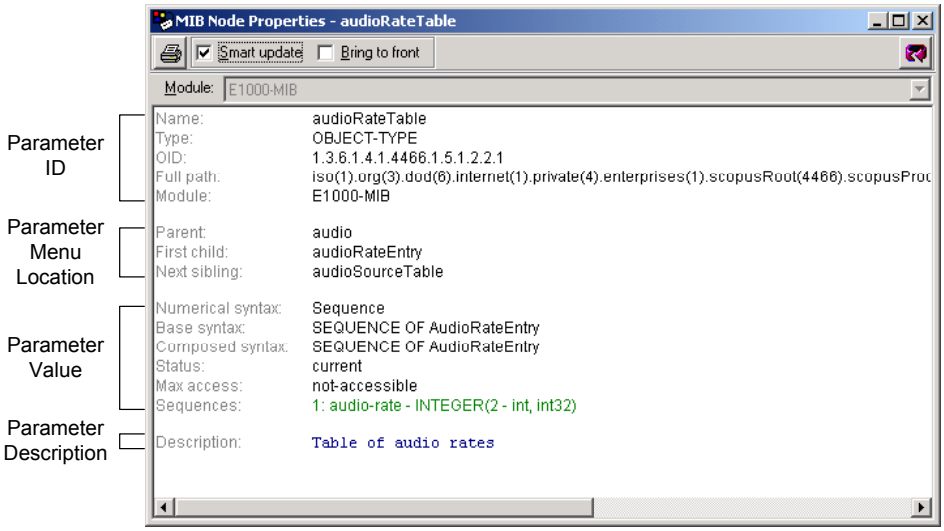


Figure 4-26: Encoder Parameter Property Sheet - Example 2



4.5.4. E-1000 SNMP Agent Traps

The traps provided by the E-1000 SNMP Agent are listed in Table 4-14.

Table 4-14: E-1000 SNMP Agent Traps

TRAP #	TRAP DESCRIPTION
1	TRAP_encoder_initial_connection_trap
2	TRAP_encoder_is_alive_trap
3	TRAP_encoder_is_terminated_trap
4	TRAP_encoder_is_shutdown_trap
5	TRAP_encoder_is_ready_trap
6	TRAP_encoder_is_recovered_trap
7	TRAP_encoder_is_normalized_trap
8	TRAP_encoder_initial_acquaintance_trap
11	TRAP_video_fault_trap
12	TRAP_audio_fault_trap
13	TRAP_mux_fault_trap
14	TRAP_temperature_fault_trap
21	TRAP_video_absent_trap
22	TRAP_audio_absent_trap
31	TRAP_setup_file_missing_trap
41	TRAP_ftp_success_trap
42	TRAP_ftp_failure_trap

Section 5
MAINTENANCE

5.1. GENERAL

This Section provides maintenance instructions for the CODICO® E-1000 Series Encoders. These instructions include test procedures and fault isolation directives.

5.2. SAFETY INSTRUCTIONS

WARNING

WHENEVER IT IS SUSPECTED THAT SAFETY PROTECTION IS IMPAIRED, THE EQUIPMENT MUST BE MADE INOPERATIVE AND SECURED AGAINST UNINTENDED OPERATION AND THE APPROPRIATE SERVICING AUTHORITY MUST BE INFORMED.

SAFETY IS LIKELY TO BE IMPAIRED IF, FOR EXAMPLE, THE EQUIPMENT FAILS TO PERFORM THE INTENDED FUNCTIONS OR SHOWS VISIBLE DAMAGE.

SERVICING AND MAINTENANCE INSTRUCTIONS ARE FOR QUALIFIED PERSONNEL ONLY. TO REDUCE THE RISK OF SHOCK AND DAMAGE TO EQUIPMENT, DO NOT PERFORM ANY SERVICING AND MAINTENANCE UNLESS YOU ARE QUALIFIED TO DO SO.

5.2.1. Safety Precautions

The equipment described in this manual contains parts that are connected to the electrical power supply. This is a potentially lethal voltage.

For correct and safe use of the equipment, it is essential that operating and servicing personnel follow generally accepted safety procedures in addition to the safety precautions specified in this manual. Specific warning and caution statements, where applicable, appear throughout this manual.

Warning and Caution symbols are marked on the hardware where necessary.

5.2.2. Caution and Warning Statements

Throughout this manual, the following caution and warning symbols are used:

CAUTION SYMBOL

THE CAUTION SYMBOL IS USED TO INDICATE CORRECT OPERATION OR MAINTENANCE IN ORDER TO PREVENT DAMAGE TO OR DESTRUCTION OF EQUIPMENT OR OTHER PROPERTY.

WARNING SYMBOL

THE WARNING SYMBOL IS USED TO INDICATE A POTENTIAL HAZARD THAT REQUIRES CORRECT PROCEDURES OR PRACTICES IN ORDER TO PREVENT PERSONAL INJURY.

5.2.3. Technical Support

In case of technical problems with the CODICO® system or one of its components, refer to the System Documentation. In most instances, this may save you time in resolving technical difficulties.

Should you not be able to resolve the problem, call your local distributor for technical support.

5.2.4. How To Return Faulty Parts

Before returning an item:

1. Request a RMA (Return Merchandise Authorisation) Tracking Number from your local Distributor.
2. Scopus Network Technologies support will assign a RMA Tracking Number; this must accompany the item being returned and will be referred to in all correspondence.
3. The item is sent to Scopus Network Technologies with the RMA Number included in the accompanying documentation (shipping and customs forms).

5.2.5. Customer Support Point Of Contact (POC)

Scopus Network Technologies Inc.
U.S. Offices

100 Overlook Center Drive, 3rd Floor
Princeton, NJ 08540.
USA

Tel: (609)-987-8090
Fax: (609)-987-8095

Scopus Network Technologies Ltd.
International Headquarters

10 Ha'amal St., Park Afek
Rosh Ha'ayin, 48092
Israel

Tel: (972) -3-9007777
Fax: (972) -3-9007888

Email: support@scopus.net
Web: www.scopus.net

5.3. TEST PROCEDURES

The diagnostic and troubleshooting tests available for the E-1000 Series of MPEG-2 Professional Encoders consists of the following groups of tests:

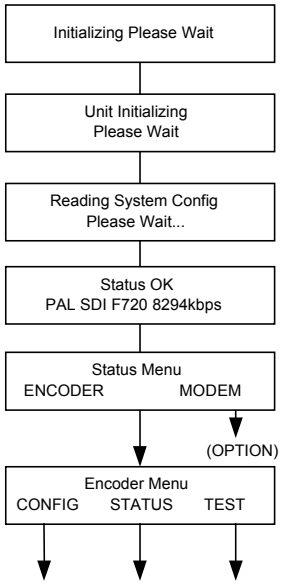
1. **Operational Checks:**
   Checks the operational status of the E-1000.
   - Power-Up Check (see paragraph 5.3.1):
     Checks the system initialization at power up.
   - **Serviceability Check** (see paragraph 5.3.2)
     Checks the system audio and video processing operation.
2. **Troubleshooting and Fault Isolation:**
   The E-1000 generates status reports and warning messages during operation. These messages are grouped into two categories:
   - **Front Panel Status Messages** (see paragraph 5.4.1):
     Messages generated by the front panel unit and are displayed on the front panel LCD.
   - **Encoder Status Messages** (see paragraph 5.4.2):
     Messages generated by the encoder itself and displayed on the optional monitor, connected to the encoder.

5.3.1. Power-Up Check.

The initialization sequence of the encoder is as follows:

1. Ensure that the Compact Flash is fully inserted into the receptacle located on the front panel.
2. Power Up the E-1000 Series unit and check:
   - The internal fan start.
   - That the front panel illuminates and the LCD lights-up and displays the status messages of the initialization sequence.
3. The initialization sequence flow diagram is displayed in Figure 5-1 (refer to paragraph 2.5.2 for a detailed description of the sequence).
4. Once the initialization is completed, the display should show the STATUS OK message.

Figure 5-1: E-1000 Series Encoder - Panel Initialization Sequence



5.3.2. Serviceability Check

After performing any installation, initialization, or configuration to the E-1000 Series Encoders, maintenance checks should be performed to ensure that the unit is serviceable. It consists of the following tests:

- Video Test, refer to paragraph 0.
- Audio Test, refer to paragraph 5.3.2.2.

An IRD-2600 Integrated Receiver Decoder (or similar), a video monitor and a loudspeaker must be connected to E-1000 Series encoders in order to perform the maintenance checks.

NOTES

The monitor connection is optional and needed only to view the Test Bar.

The speaker connection is optional and needed only to hear the test sounds generated during the test procedure.

5.3.2.1. Video Test.

Test Setup:

1. Connect the E-1000 Series Encoders to the IRD.
2. Connect the IRD to the monitor.

Test Procedure:

1. Enter the main menu of the E-1000 Series Encoder.
2. Select the TEST option and press **[Enter]**.
3. Select the VIDEO TEST option and press **[Enter]**.
4. Press the ESC button twice.
5. Select the SAVE option from the menu.
6. Press **[Enter]** to start the VIDEO TEST.

Test Results:

The monitor, if connected, will show the Test Bar.

Removing the Test:

1. Enter the main menu of the E-1000 Series Encoders.
2. Select the TEST option and press **[Enter]**.
3. Select the VIDEO TEST option and press **[Enter]**.
4. Press the ESC button twice.
5. Select the SAVE option from the menu.
6. Press **[Enter]** to stop the VIDEO TEST.

5.3.2.2. Audio Test

Test Setup:

1. Connect the E-1000 Series Encoders to the IRD.
2. Connect the IRD to the speaker.

Test Procedure:

1. Enter the main menu of the E-1000 Series Encoder.
2. Select the TEST option and press **[Enter]**.
3. Select the AUDIO TEST option and press **[Enter]**.
4. Press the ESC button twice.
5. Select the SAVE option from the menu.
6. Press **[Enter]** to start the AUDIO TEST.

Test Results:

The speaker, if connected, will make a continuous beep sound.

Removing the Test:

1. Enter the main menu of the E-1000 Series Encoders.
2. Select the TEST option and press **[Enter]**.
3. Select the AUDIO TEST option and press **[Enter]**.
4. Press the ESC button twice.
5. Select the SAVE option from the menu.
6. Press **[Enter]** to stop the AUDIO TEST.

5.4. STATUS AND DIAGNOSTIC MESSAGES

The E-1000 Series of MPEG-2 Professional Encoders generates two types of status messages:

- Front Panel Status messages, which are generated by the encoder front panel and are displayed on the front panel LCD. Refer to paragraph 5.4.1 for a detailed description.
- Encoder Diagnostic messages, which are generated by the encoder operating system and displayed on an external VGA monitor connected to the encoder. Refer to paragraph 5.4.2 for a detailed description.

5.4.1. Front Panel Status Messages

After the E-1000 initialization is completed, the E-1000 LCD displays the Status Message of the encoder. These messages are divided into two groups:

- Fail To Comply Messages, which are the response of the encoder to requests from the operator (see paragraph 5.4.1.1).
- Encoder Warning Messages, which are operational warning messages generated by the encoder (see paragraph 5.4.1.2).

NOTE

The E-1000 front panel includes one Status LED. The LED operation is correlated with the status message displayed.

When the E-1000 operates correctly, the Status LED lights steady in green, and the "status ok" message is displayed on the LCD.

5.4.1.1. Fail To Comply Messages

The Fail To Comply Messages are displayed when the encoder fails to comply with the operator requests/commands. Table 5-1 lists and describes the messages available and the response of the Status LED when the message is displayed. It also describes the message and suggests the most common correction actions required.

Table 5-1 Fail To Comply Messages

MESSAGE	LED RESPONSE	DESCRIPTION
Unit Not Responding	RED LED BLINK	The encoder does not respond to commands from the E-1000 Front Panel. Check the Encoder Diagnostic report (Refer to paragraph 5.4.2).
Comm Checksum Error	RED LED BLINK	Communication errors are detected between the encoder and the front panel. Check the Encoder Diagnostic report (Refer to paragraph 5.4.2).
Unit Busy	GREEN LED BLINK	The encoder is busy with previous tasks and cannot respond to commands from the E-1000 Front Panel. Wait for task completion. If the task fails to complete within a predefined time period, the encoder will display a "**Unit Not Responding**" fail to comply message.
Illegal Setup	RED LED BLINK	The encoder cannot comply with the requests from the E-1000 Front Panel. Check the parameters for illegal inputs.

5.4.1.2. Encoder Warning Messages

The Encoder Warning Messages are displayed when the encoder detects a failure in the normal operation of the encoder. Table 5-2 lists and describes the messages available and the response of the Status LED when the message is displayed.

Table 5-2 Encoder Warning Messages

MESSAGE	LED RESPONSE	DESCRIPTION
Temp. High >49℃	GREEN LED BLINK	Encoder internal temperature is higher than 49^0C. Check room temperature in the encoder area. If higher than normal room temperature, lower by air-conditioning or external ventilation. Check encoder ventilation and airflow. Remove all airflow interfering objects.
Ext. Clock Absent	GREEN LED BLINK	External reference clock input to the encoder is missing. Check proper operation of the external clock source.
Video Input Absent	GREEN LED BLINK	External video input to the encoder is missing. Check proper video input signal.
Audio Input Absent	GREEN LED BLINK	External audio input to the encoder is missing. Check proper audio input signal.
Video Fault	RED LED BLINK	External video input and/or failure in the video processing by the encoder. Check proper and consistent video input data and format. Check correct video processing set-up for the input video format.

Table 5-2 Encoder Warning Messages

MESSAGE	LED RESPONSE	DESCRIPTION
Audio Fault	RED LED BLINK	External audio input and/or failure in the audio processing by the encoder. Check proper and consistent audio input data. Check correct audio sampling rate for the input audio information.
Video & Audio Fault	RED LED BLINK	Failure in the video and audio processing by the encoder. Check proper and consistent audio and video input data and format. Check correct processing set-up.

5.4.2. Encoder Status Messages

Any fault that prevents the encoder from normal boot-up, causes the message "**Unit not responding**" to be displayed on the Front Panel.

In this case, the user must attach the terminal to the encoder and check the error message (always sent to monitor port).

All error messages are textual messages and in most cases they are self-explanatory. In most cases, the user can correct the errors by receiving help from Scopus support stuff.

The following are several encoder status messages and the suggested troubleshooting steps:

- **Flash Disk Mount Failed. Disk might be missing?**
  Check the presence of the flash disk. Exchange disks between encoder units to verify correct structure of the "suspicious" flash disk.
- **File "filename" is missing.**
  Some vital file is missing from the Flash Disk. Perform full SW upgrade procedure.

5.5. REAR PANEL CONNECTORS - PIN ASSIGNMENT

The pin assignment for the connectors on the E-1000 is detailed in Table 5-3 through Table 5-9 .Table 5-10 describes and lists the pin assignment for the optional Audio Channel 3.4 connector.

Table 5-3: ANALOG 1/2 L/R Interface Pin-to-Signal Assignment

PIN #	SIGNAL
1	Ground
2	Positive
3	Negative

Table 5-4: GPI Interface Pin-to-Signal Assignment

PIN #	SIGNAL
1	Normally Closed
2	Common
3	Normally Open

Table 5-5: HSD Interface Pin-to-Signal Assignment

PIN #	SIGNAL
1	CLOCK IN +
2	CLOCK IN -
3	Reserved for future applications
4	CLOCK OUT +
5	CLOCK OUT -
6	Reserved for future applications
7	DATA IN +
8	DATA IN -

Table 5-6: Monitor Interface Pin-to-Signal Assignment

PIN #	SIGNAL
1	--
2	Rx
3	Tx
4	--
5	GND
6	--
7	--
8	--
9	--

Table 5-7: Data Control (RS-232) Interface Pin-to-Signal Assignment

PIN #	SIGNAL
1	--
2	Rx
3	Tx
4	--
5	GND
6	--
7	--
8	--
9	---

Table 5-8: RS-422 Output 1 Connection Interfaces Pin-to-Signal Assignment

PIN #	SIGNAL
1	CLK +
2	CLK -
3	GND
4	G.703-BALANCED E1 on Out1 only
5	G.703-BALANCED E1 on Out1 only
6	GND
7	DATA +
8	DATA -

Table 5-9: RS-422 Output 2 Connection Interfaces Pin-to-Signal Assignme

PIN #	SIGNAL
1	CLK +
2	CLK -
3	GND
4	CLKIN + (OUT 2 ONLY)
5	CLKIN - (OUT 2 ONLY)
6	GND
7	DATA +
8	DATA -

NOTE

Pins 4 and 5, required for external clocking, are enabled only on the OUT 2 connector. DO NOT USE THE OUT 1 CONNECTOR FOR EXTERNAL CLOCKING.

Table 5-10: Audio Channel 3,4 Connector (Option)

PIN NO	NAME	DESCRIPTION
1	N.C.	
2	N.C.	
3	N.C.	
4	N.C.	
5	Gnda	
6	N.C.	
7	ANA_AES_DRIN-	Analog Audio CH4 Right (-) or Digital AES/EBU(-)

Table 5-10: Audio Channel 3,4 Connector (Option)

PIN NO	NAME	DESCRIPTION
8	ANA_AES_DRIN+	Analog Audio CH4 Right (+) or Digital AES/EBU(-)
9	N.C.	
10	Gnda	
11	N.C.	
12	CLIN-	Analog Audio CH3 Left (-)
13	CLIN+	Analog Audio CH3 Left (+)
14	N.C.	
15	N.C.	
16	N.C.	
17	DLIN-	Analog Audio CH4 Left (-)
18	DLIN+	Analog Audio CH4 Left (+)
19	N.C.	
20	Gnda	
21	N.C.	
22	ANA_AES_CRIN-	Analog Audio CH3 Right (-) or Digital AES/EBU(-)
23	ANA_AES_CRIN+	Analog Audio CH3 Right (+) or Digital AES/EBU(+)
24	N.C.	
25	Gnda	

NOTE

Use a "D25 type to XLR" adapter cable, Cat no. 23499315800.